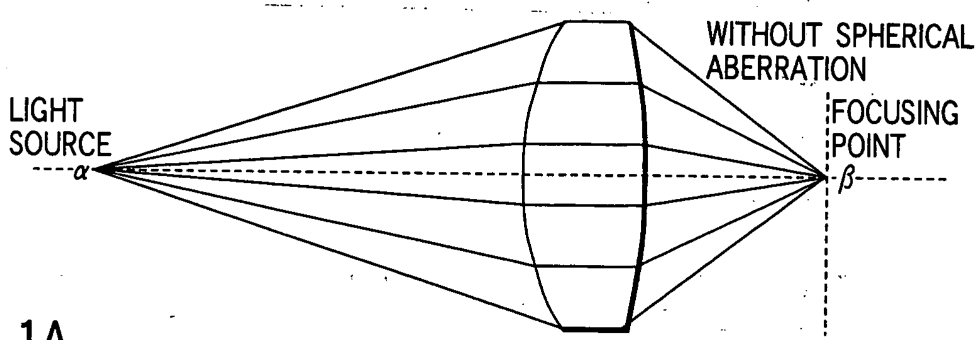


FIG. 1A

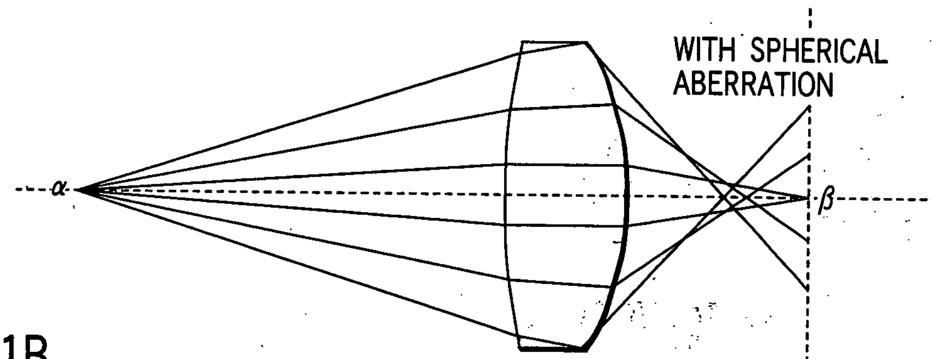


FIG. 1B

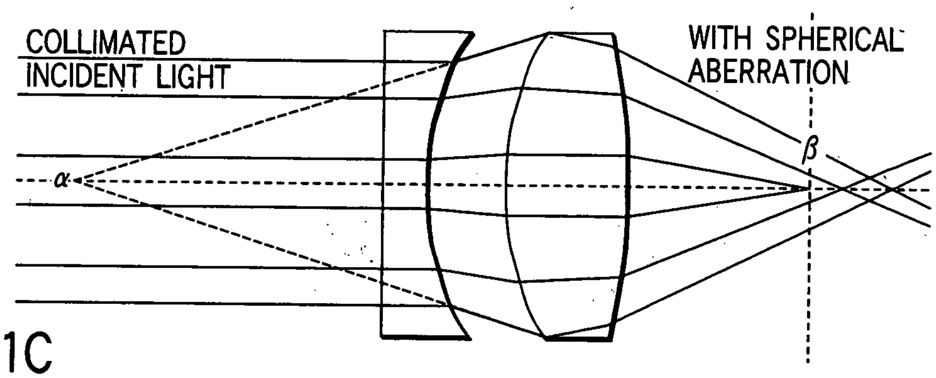


FIG. 1C

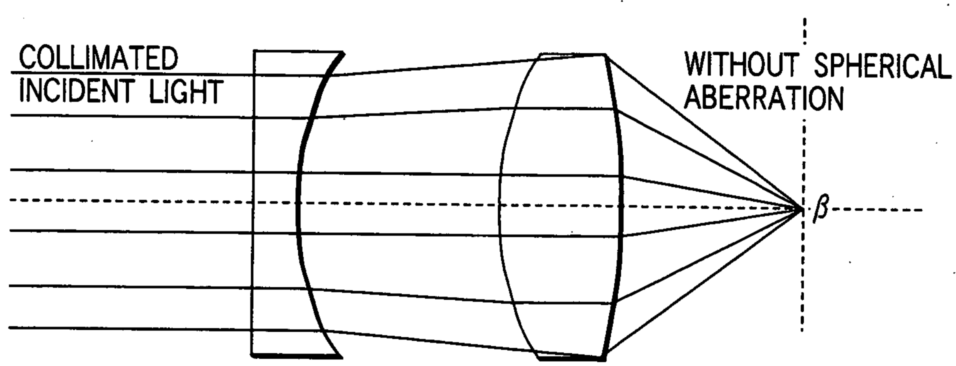
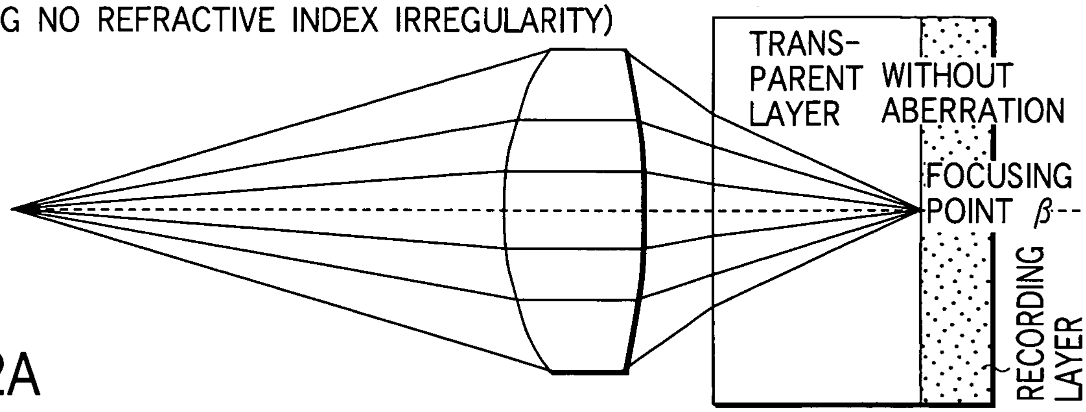


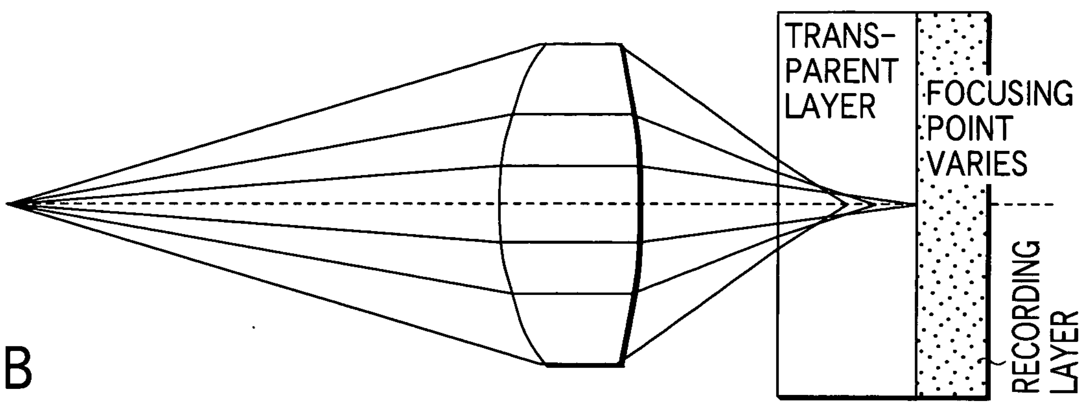
FIG. 1D

STATE WHERE FOCUS IS ATTAINED ON RECORDING LAYER WITH TRANSPARENT LAYER THICKNESS OF REFERENCE VALUE BY USING OPTICAL SYSTEM WITHOUT SPHERICAL ABERRATION
(ASSUMING NO REFRACTIVE INDEX IRREGULARITY)



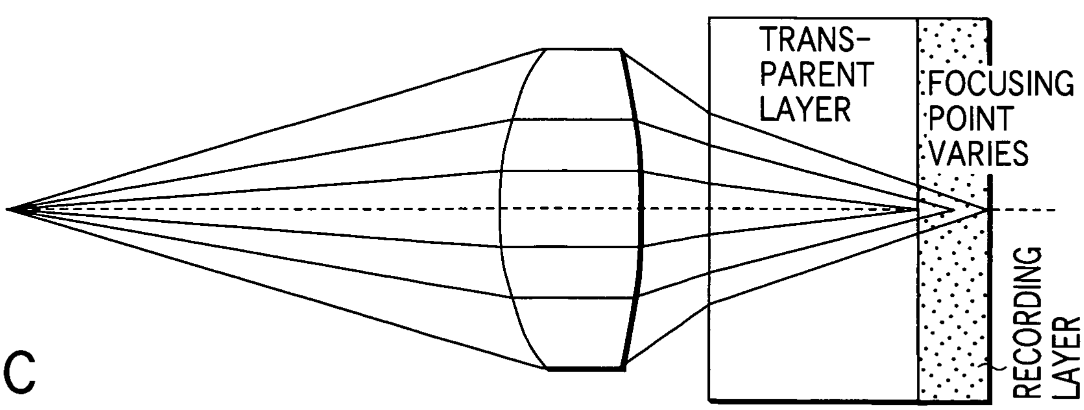
F I G. 2A

STATE WHERE ABERRATION OCCURS WHEN THICKNESS OF TRANSPARENT LAYER VARIES IN DIRECTION IN WHICH IT BECOMES SMALLER THAN REFERENCE VALUE
(THE SAME APPLIES TO CASE WHERE REFRACTIVE INDEX OF TRANSPARENT LAYER VARIES IN DIRECTION IN WHICH IT BECOMES LOWER THAN REFERENCE LEVEL)



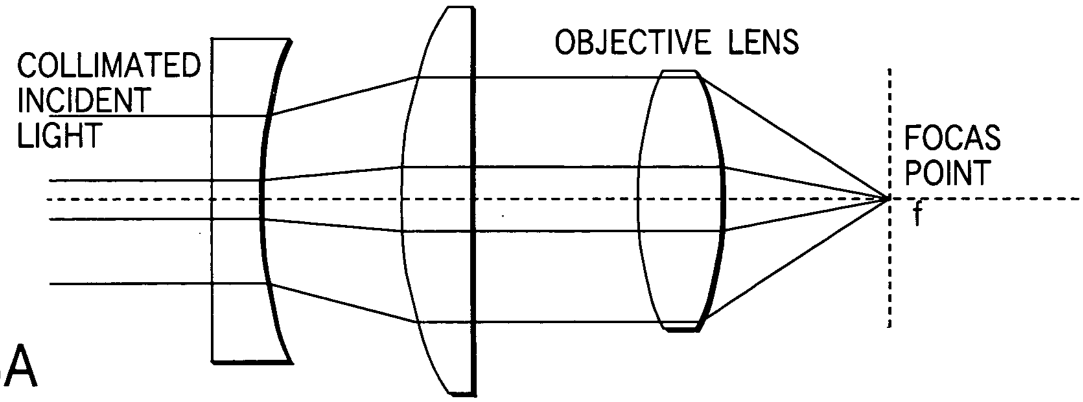
F I G. 2B

STATE WHERE ABERRATION OCCURS WHEN THICKNESS OF TRANSPARENT LAYER VARIES IN DIRECTION IN WHICH IT BECOMES LARGER THAN REFERENCE VALUE
(THE SAME APPLIES TO CASE WHERE REFRACTIVE INDEX OF TRANSPARENT LAYER VARIES IN DIRECTION IN WHICH IT BECOMES HIGHER THAN REFERENCE LEVEL)



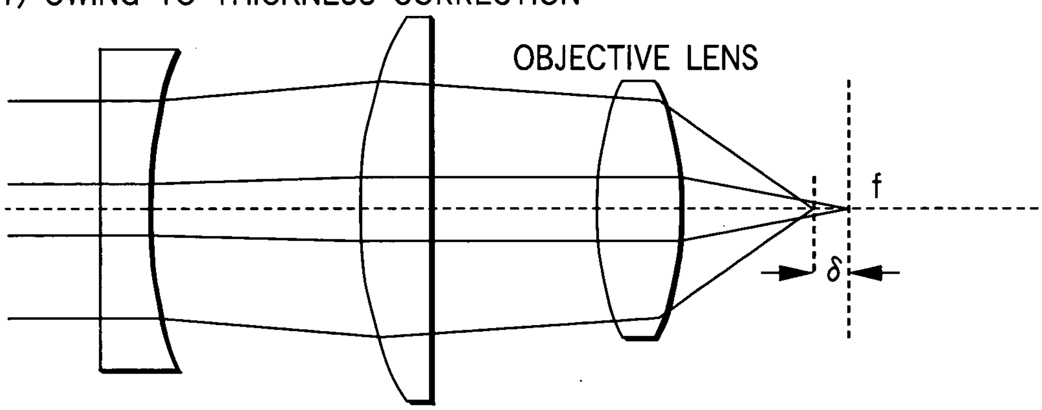
F I G. 2C

STATE WHERE FOCUS IS ADJUSTED WHEN PARALLEL LIGHT IS INCIDENT ON OBJECTIVE LENS WITHOUT ANY THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) OF TRANSPARENT LAYER (ZERO CORRECTION AMOUNT)



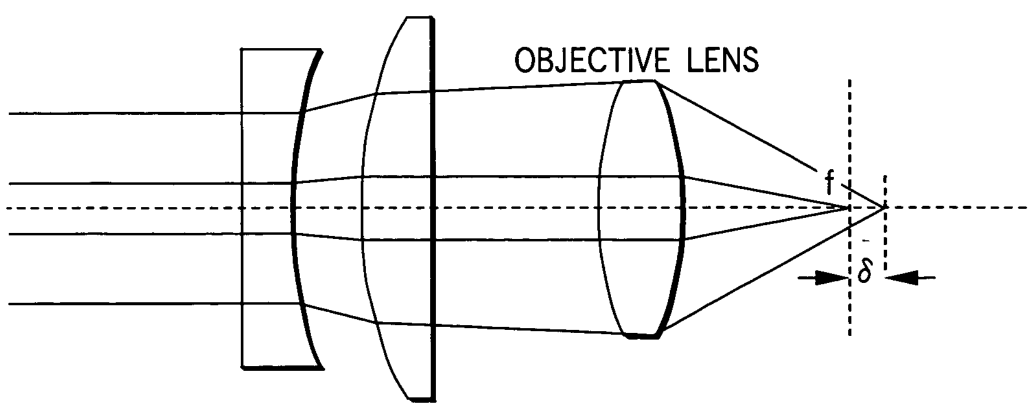
F I G. 3A

STATE WHERE LIGHT INCIDENT ON OBJECTIVE LENS BECOMES NONPARALLEL (CONVERGENT) OWING TO THICKNESS CORRECTION



F I G. 3B

STATE WHERE LIGHT INCIDENT ON OBJECTIVE LENS BECOMES NONPARALLEL (DIVERGENT) OWING TO THICKNESS CORRECTION



F I G. 3C

IN CASE WHERE FOCUSING POINT β SET BY OBJECTIVE LENS COINCIDES WITH POSITION ON RECORDING LAYER (LIGHT REFLECTED BY RECORDING LAYER AND HAVING PASSED THROUGH OPTICAL SYSTEM UNIT 70 IS KEPT PARALLEL)

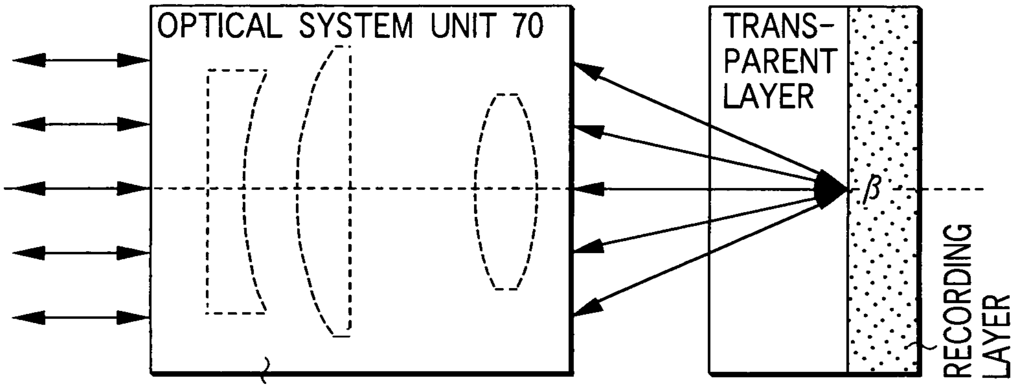


FIG. 4A OBJECTIVE LENS OPTICAL SYSTEM+THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) CORRECTION OPTICAL SYSTEM

IN CASE WHERE FOCUSING POINT β SET BY OBJECTIVE LENS IS LOCATED BEHIND POSITION ON RECORDING LAYER (LIGHT REFLECTED BY RECORDING LAYER AND HAVING PASSED THROUGH OPTICAL SYSTEM UNIT 70 BECOMES DIVERGENT LIGHT)

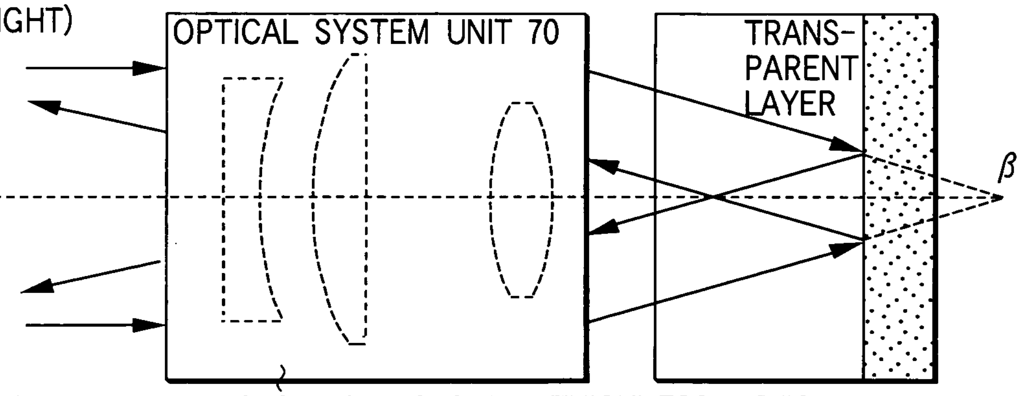


FIG. 4B OBJECTIVE LENS OPTICAL SYSTEM+THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) CORRECTION OPTICAL SYSTEM

IN CASE WHERE FOCUSING POINT β SET BY OBJECTIVE LENS IS LOCATED BEFORE POSITION ON RECORDING LAYER (LIGHT REFLECTED BY RECORDING LAYER AND HAVING PASSED THROUGH OPTICAL SYSTEM UNIT 70 BECOMES CONVERGENT LIGHT)

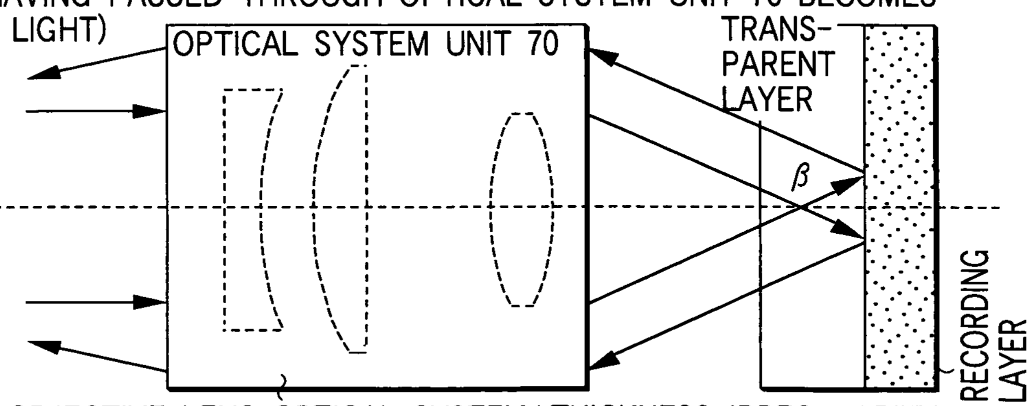
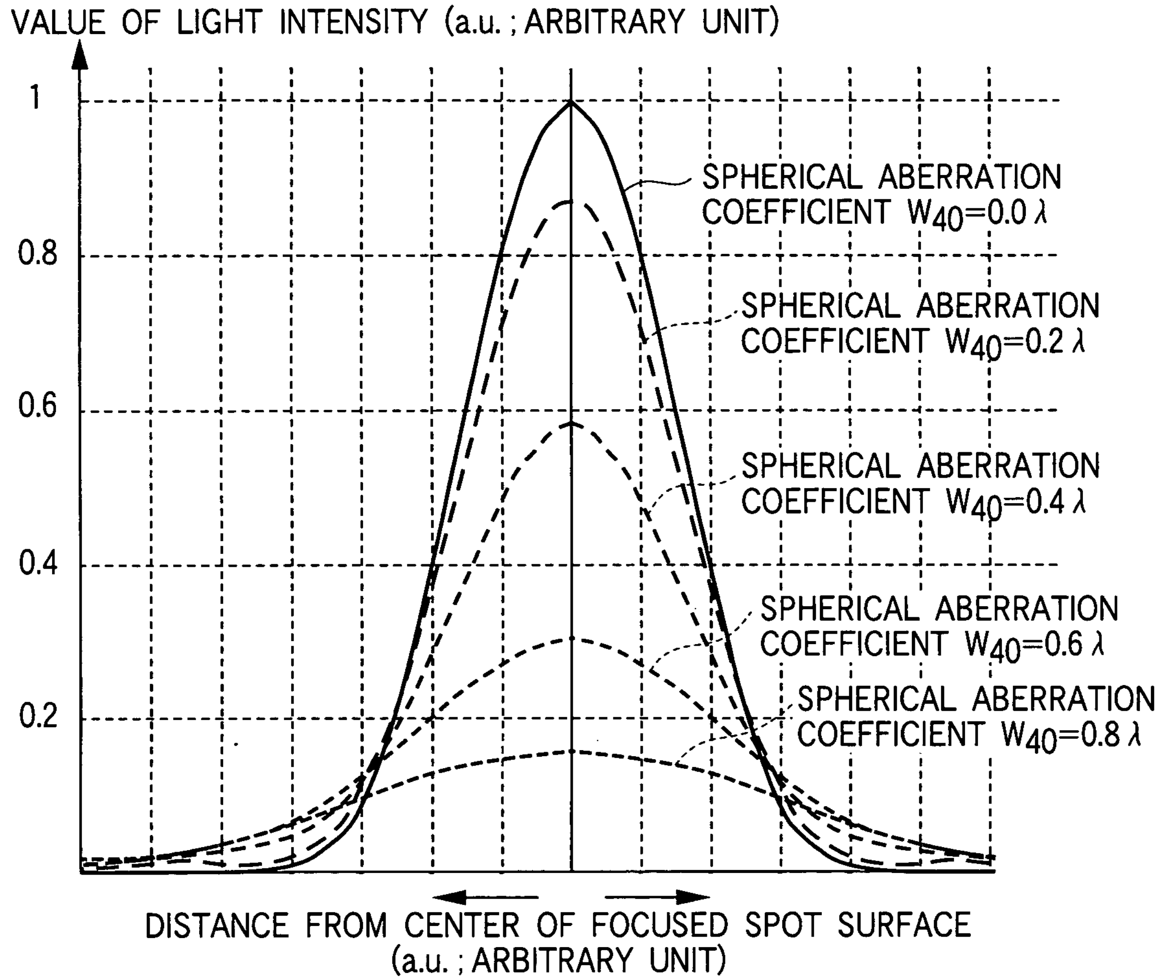
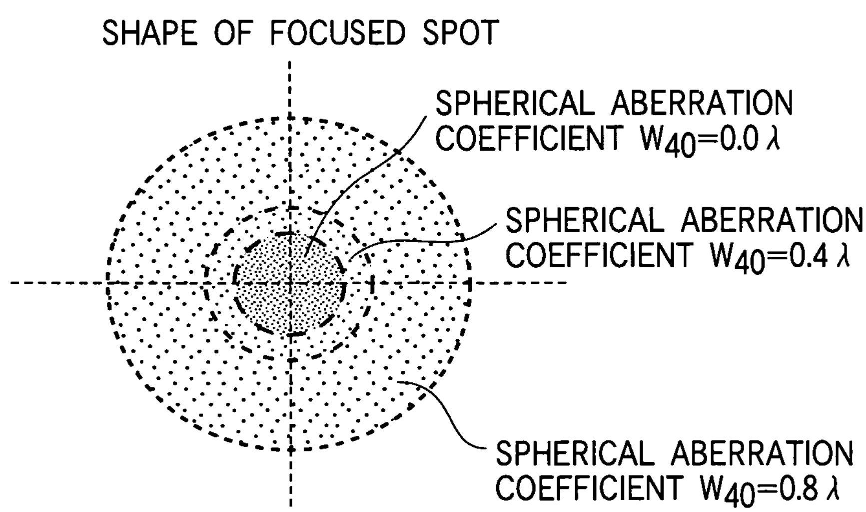


FIG. 4C OBJECTIVE LENS OPTICAL SYSTEM+THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) CORRECTION OPTICAL SYSTEM


VALUE OF LIGHT INTENSITY (a.u. ; ARBITRARY UNIT)
1
0.8
0.6
0.4
0.2
SPHERICAL ABERRATION COEFFICIENT W40=0.0 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.2 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.4 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.6 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.8 λ
DISTANCE FROM CENTER OF FOCUSED SPOT SURFACE
(a.u. ; ARBITRARY UNIT)

F I G. 5A


SHAPE OF FOCUSED SPOT
SPHERICAL ABERRATION COEFFICIENT W40=0.0 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.4 λ
SPHERICAL ABERRATION COEFFICIENT W40=0.8 λ

F I G. 5B

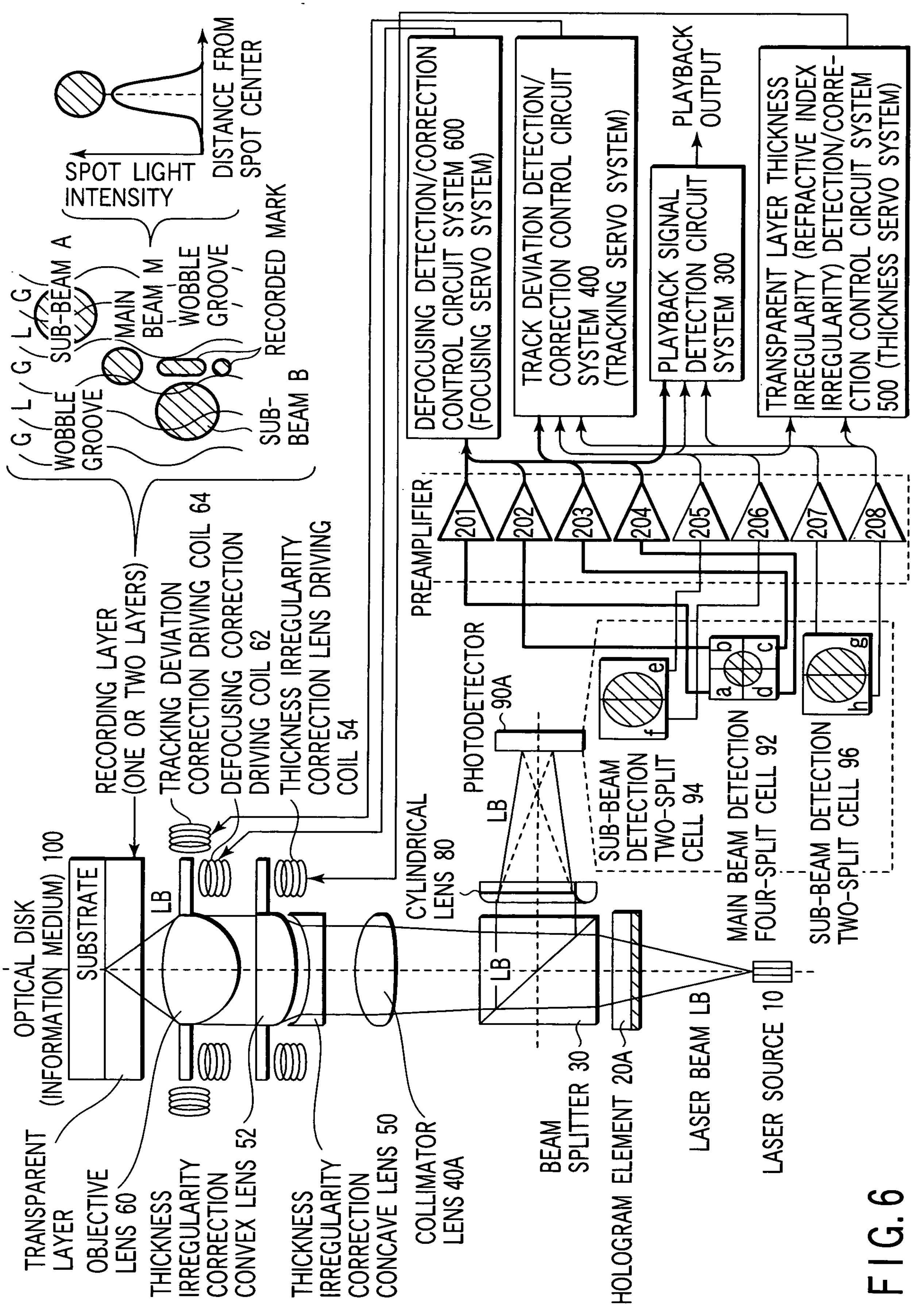

OPTICAL DISK (INFORMATION MEDIUM) 100
SUBSTRATE
RECORDING LAYER (ONE OR TWO LAYERS)
TRANSPARENT LAYER
OBJECTIVE LENS 60
THICKNESS IRREGULARITY CORRECTION CONVEX LENS 52
THICKNESS IRREGULARITY CORRECTION CONCAVE LENS 50
COLLIMATOR LENS 40A
BEAM SPLITTER 30
HOLOGRAM ELEMENT 20A
LASER BEAM LB
LASER SOURCE 10
LB
TRACKING DEVIATION CORRECTION DRIVING COIL 64
DEFOCUSING CORRECTION DRIVING COIL 62
THICKNESS IRREGULARITY CORRECTION LENS DRIVING COIL 54
CYLINDRICAL LENS 80
PHOTODETECTOR 90A
SUB-BEAM DETECTION TWO-SPLIT CELL 94
MAIN BEAM DETECTION FOUR-SPLIT CELL 92
SUB-BEAM DETECTION TWO-SPLIT CELL 96
a b c d e f g h
PREAMPLIFIER
201 202 203 204 205 206 207 208
G L G L G
WOBBLE GROOVE
SUB-BEAM A
MAIN BEAM M
SUB-BEAM B
RECORDED MARK
SPOT LIGHT INTENSITY
DISTANCE FROM SPOT CENTER
DEFOCUSING DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 600 (FOCUSING SERVO SYSTEM)
TRACK DEVIATION DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 400 (TRACKING SERVO SYSTEM)
PLAYBACK SIGNAL DETECTION CIRCUIT SYSTEM 300
PLAYBACK OUTPUT
TRANSPARENT LAYER THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 500 (THICKNESS SERVO SYSTEM)

FIG. 6

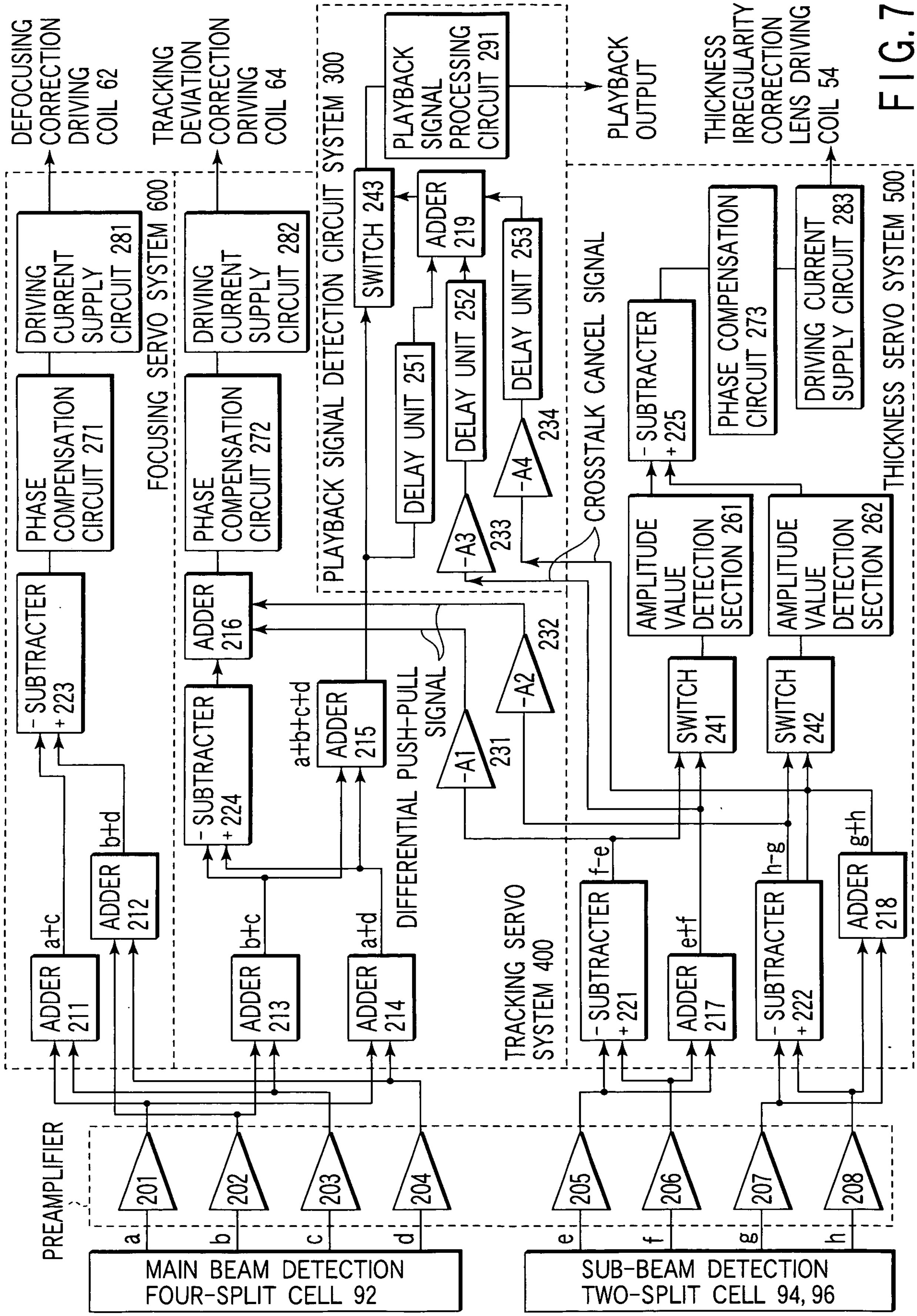

MAIN BEAM DETECTION FOUR-SPLIT CELL 92
SUB-BEAM DETECTION TWO-SPLIT CELL 94, 96
PREAMPLIFIER
a
b
c
d
e
f
g
h
201
202
203
204
205
206
207
208
ADDER 211
ADDER 212
ADDER 213
ADDER 214
ADDER 215
ADDER 216
ADDER 217
ADDER 218
ADDER 219
a+c
b+d
b+c
a+d
a+b+c+d
e+f
f-e
h-g
g+h
- SUBTRACTER + 221
- SUBTRACTER + 222
- SUBTRACTER + 223
- SUBTRACTER + 224
- SUBTRACTER + 225
-A1 231
-A2 232
-A3 233
-A4 234
SWITCH 241
SWITCH 242
SWITCH 243
DELAY UNIT 251
DELAY UNIT 252
DELAY UNIT 253
AMPLITUDE VALUE DETECTION SECTION 261
AMPLITUDE VALUE DETECTION SECTION 262
PHASE COMPENSATION CIRCUIT 271
PHASE COMPENSATION CIRCUIT 272
PHASE COMPENSATION CIRCUIT 273
DRIVING CURRENT SUPPLY CIRCUIT 281
DRIVING CURRENT SUPPLY CIRCUIT 282
DRIVING CURRENT SUPPLY CIRCUIT 283
PLAYBACK SIGNAL PROCESSING CIRCUIT 291
FOCUSING SERVO SYSTEM 600
TRACKING SERVO SYSTEM 400
PLAYBACK SIGNAL DETECTION CIRCUIT SYSTEM 300
THICKNESS SERVO SYSTEM 500
DIFFERENTIAL PUSH-PULL SIGNAL
CROSSTALK CANCEL SIGNAL
DEFOCUSING CORRECTION DRIVING COIL 62
TRACKING DEVIATION CORRECTION DRIVING COIL 64
PLAYBACK OUTPUT
THICKNESS IRREGULARITY CORRECTION LENS DRIVING COIL 54

FIG. 7

SPOT SIZE OF SUB-BEAM A DECREASES, AND SPOT SIZE OF SUB-BEAM B INCREASES DUE TO THICKNESS IRREGULARITY

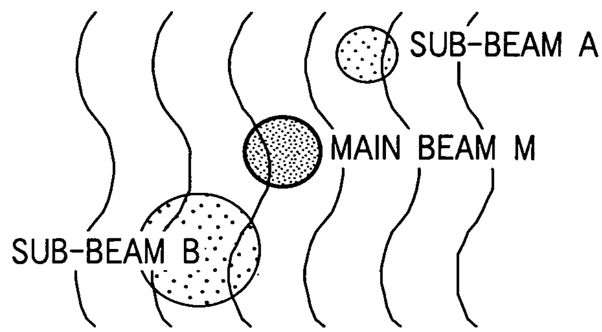


FIG. 8A

ABERRATION OF SUB-BEAM A=ABERRATION OF SUB-BEAM B
(ABERRATION OF MAIN BEAM M IS ZERO OR MINIMUM)

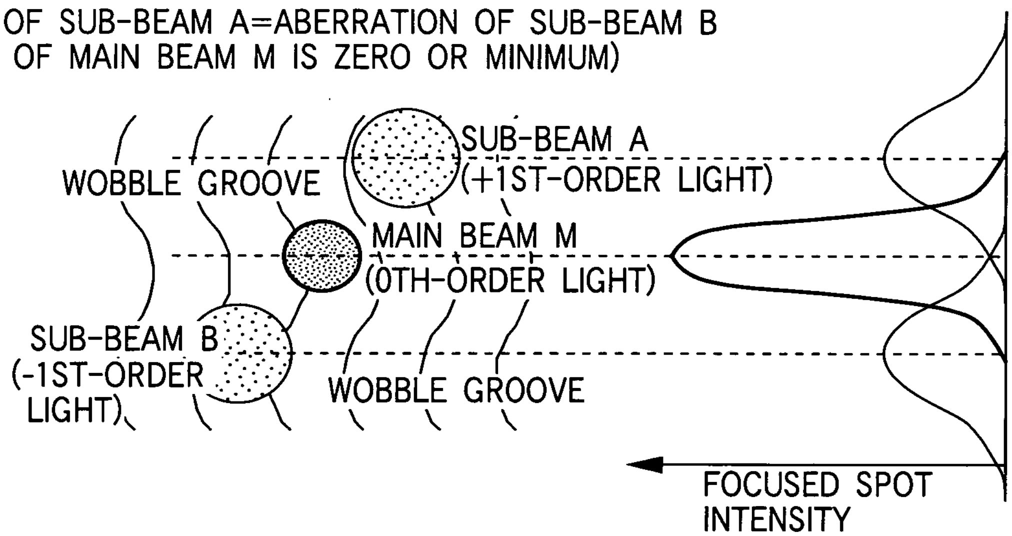


FIG. 8B

SPOT SIZE OF SUB-BEAM A INCREASES, AND SPOT SIZE OF SUB-BEAM B DECREASES DUE TO THICKNESS IRREGULARITY

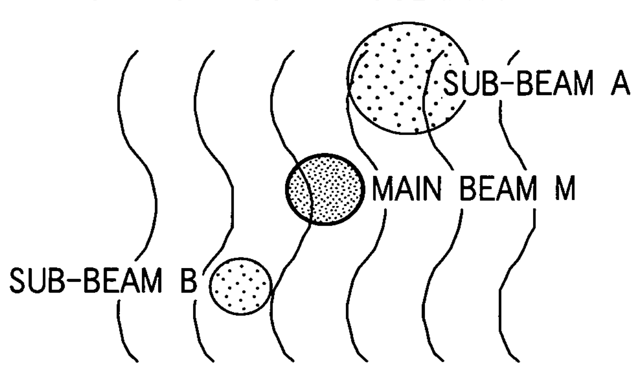


FIG. 8C

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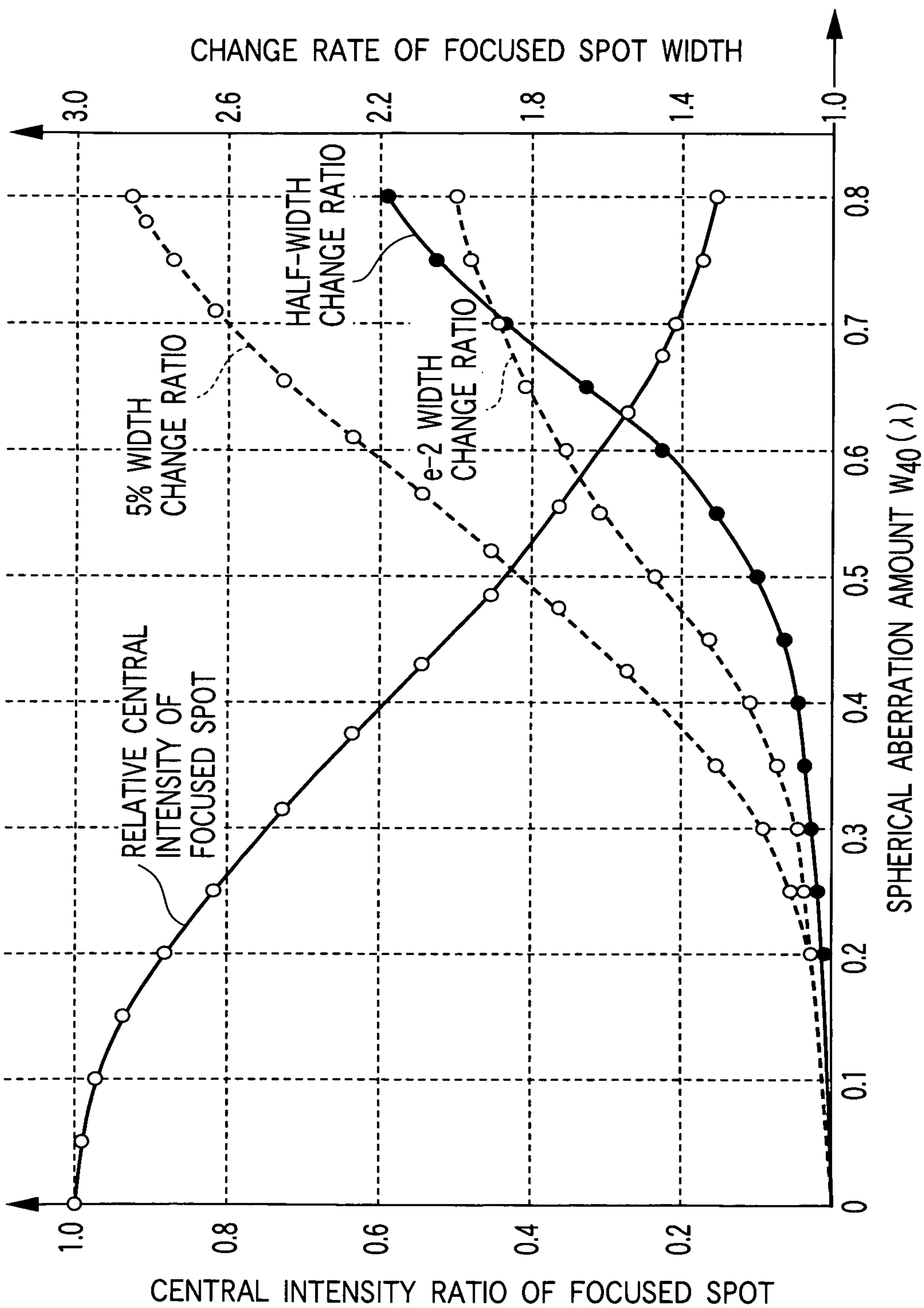


FIG. 9

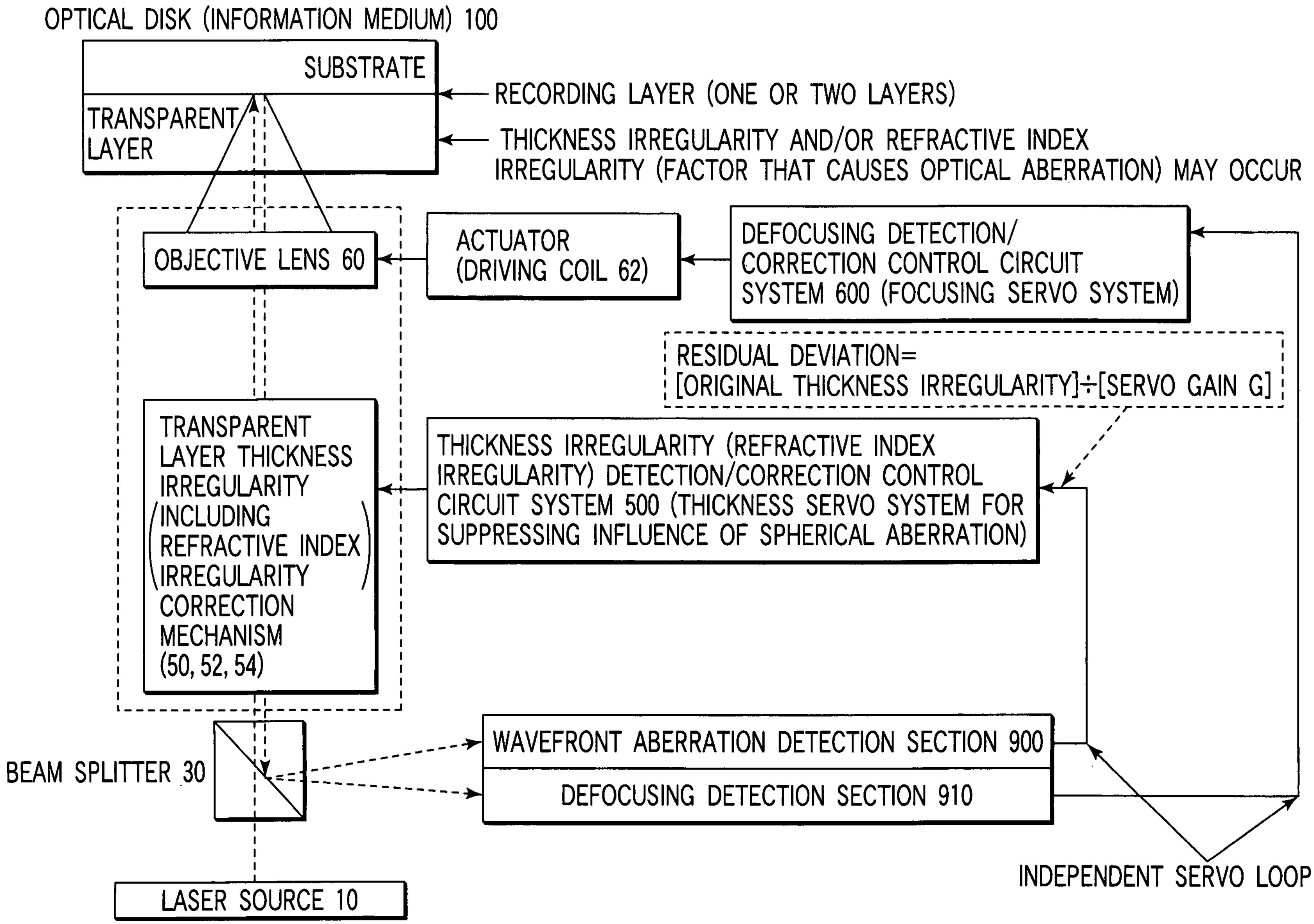

OPTICAL DISK (INFORMATION MEDIUM) 100
SUBSTRATE
TRANSPARENT LAYER
RECORDING LAYER (ONE OR TWO LAYERS)
THICKNESS IRREGULARITY AND/OR REFRACTIVE INDEX IRREGULARITY (FACTOR THAT CAUSES OPTICAL ABERRATION) MAY OCCUR
OBJECTIVE LENS 60
ACTUATOR (DRIVING COIL 62)
DEFOCUSING DETECTION/ CORRECTION CONTROL CIRCUIT SYSTEM 600 (FOCUSING SERVO SYSTEM)
RESIDUAL DEVIATION= [ORIGINAL THICKNESS IRREGULARITY]÷[SERVO GAIN G]
TRANSPARENT LAYER THICKNESS IRREGULARITY (INCLUDING REFRACTIVE INDEX IRREGULARITY) CORRECTION MECHANISM (50, 52, 54)
THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 500 (THICKNESS SERVO SYSTEM FOR SUPPRESSING INFLUENCE OF SPHERICAL ABERRATION)
BEAM SPLITTER 30
WAVEFRONT ABERRATION DETECTION SECTION 900
DEFOCUSING DETECTION SECTION 910
INDEPENDENT SERVO LOOP
LASER SOURCE 10

FIG. 10

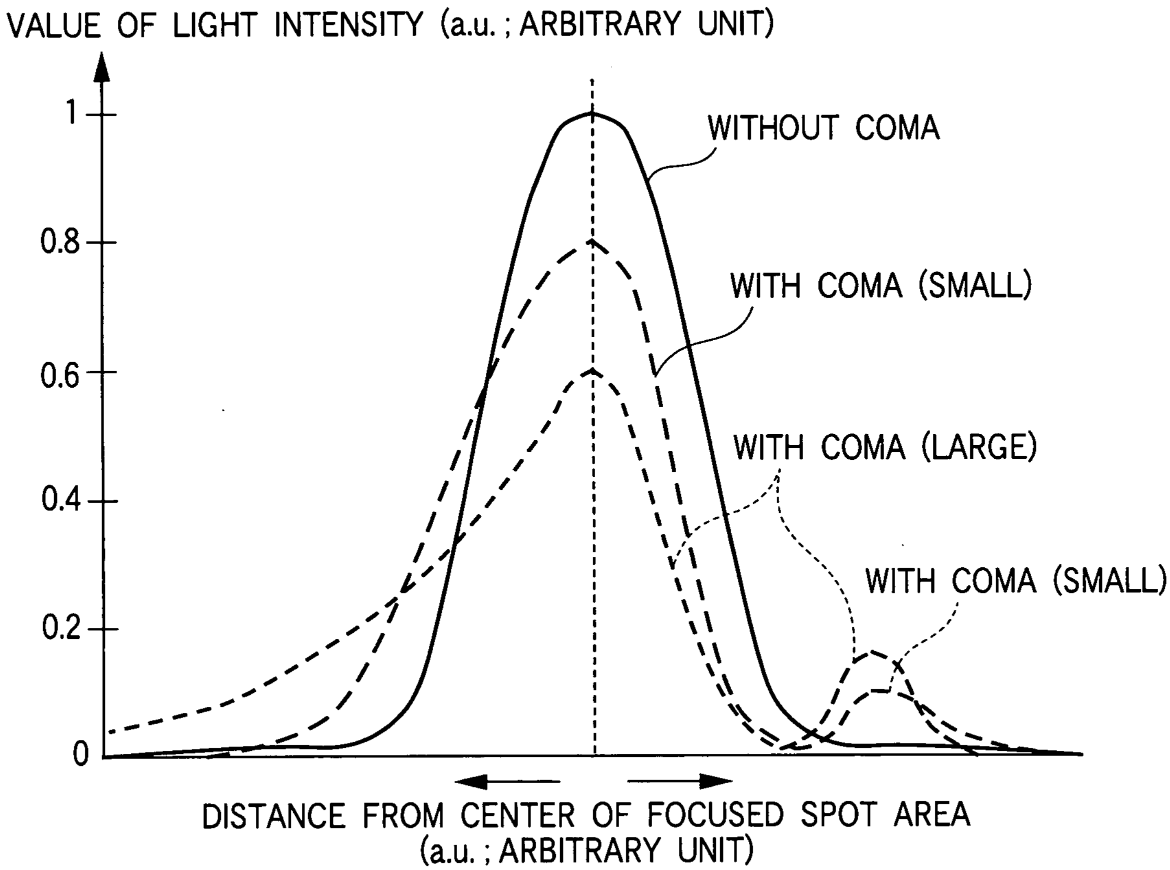


FIG. 11A

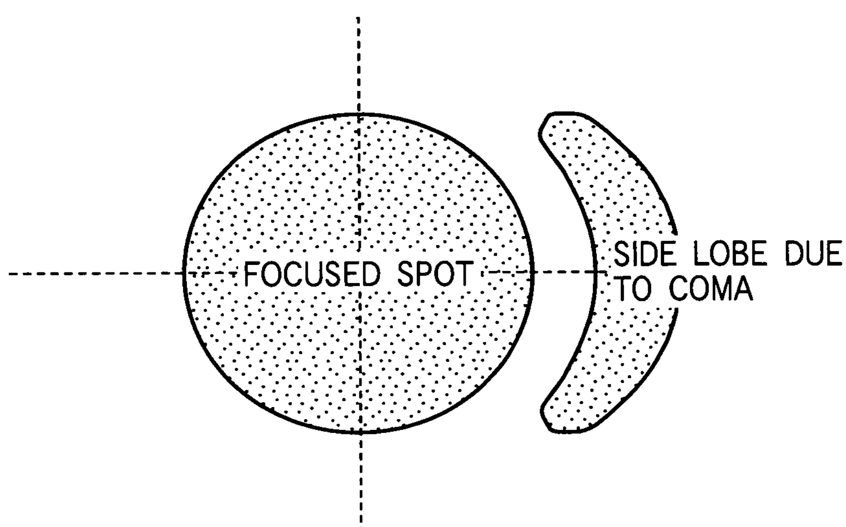


FIG. 11B

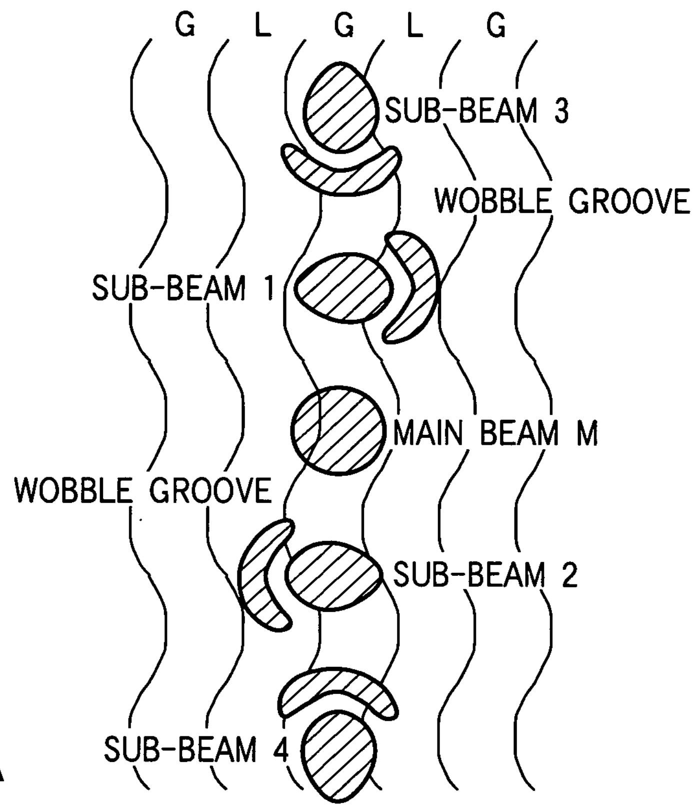


FIG. 12A

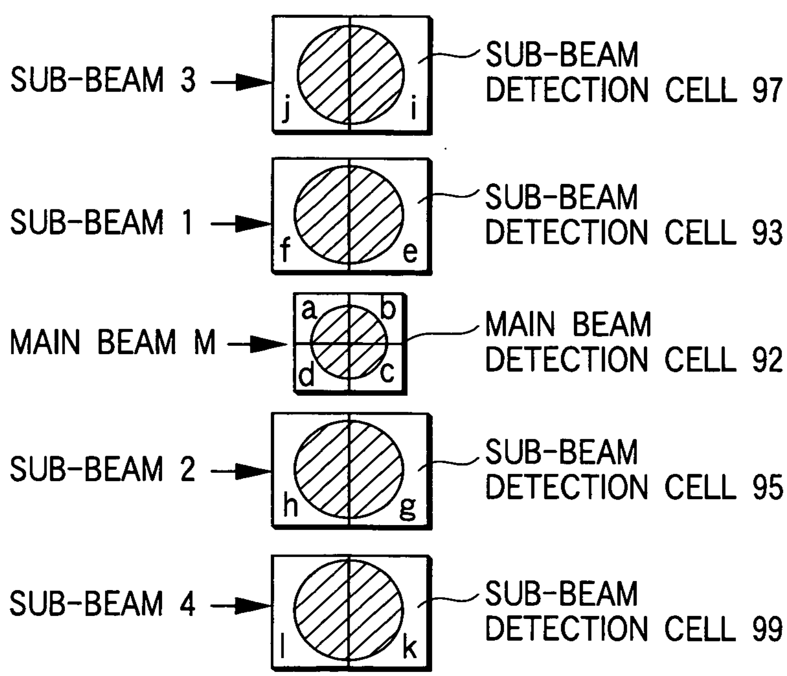
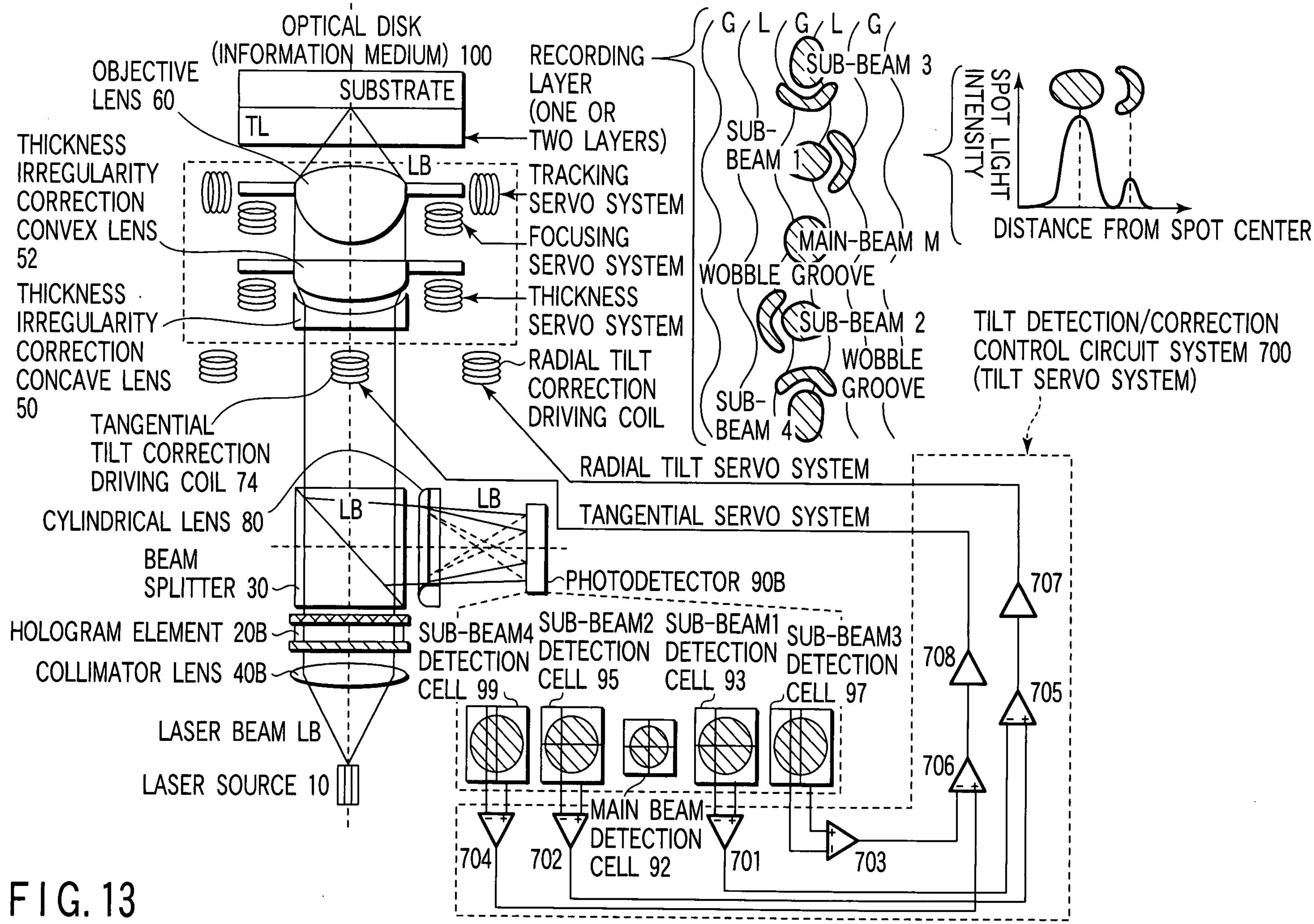


FIG. 12B


OPTICAL DISK
(INFORMATION MEDIUM) 100
SUBSTRATE
TL
OBJECTIVE LENS 60
THICKNESS IRREGULARITY CORRECTION CONVEX LENS 52
THICKNESS IRREGULARITY CORRECTION CONCAVE LENS 50
TANGENTIAL TILT CORRECTION DRIVING COIL 74
CYLINDRICAL LENS 80
BEAM SPLITTER 30
HOLOGRAM ELEMENT 20B
COLLIMATOR LENS 40B
LASER BEAM LB
LASER SOURCE 10
LB
RECORDING LAYER (ONE OR TWO LAYERS)
TRACKING SERVO SYSTEM
FOCUSING SERVO SYSTEM
THICKNESS SERVO SYSTEM
RADIAL TILT CORRECTION DRIVING COIL
G L G L G
SUB-BEAM 3
SUB-BEAM 1
MAIN-BEAM M
WOBBLE GROOVE
SUB-BEAM 2
WOBBLE GROOVE
SUB-BEAM 4
SPOT LIGHT INTENSITY
DISTANCE FROM SPOT CENTER
TILT DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 700 (TILT SERVO SYSTEM)
RADIAL TILT SERVO SYSTEM
TANGENTIAL SERVO SYSTEM
PHOTODETECTOR 90B
SUB-BEAM4 DETECTION CELL 99
SUB-BEAM2 DETECTION CELL 95
SUB-BEAM1 DETECTION CELL 93
SUB-BEAM3 DETECTION CELL 97
MAIN BEAM DETECTION CELL 92
701
702
703
704
705
706
707
708

F I G. 13

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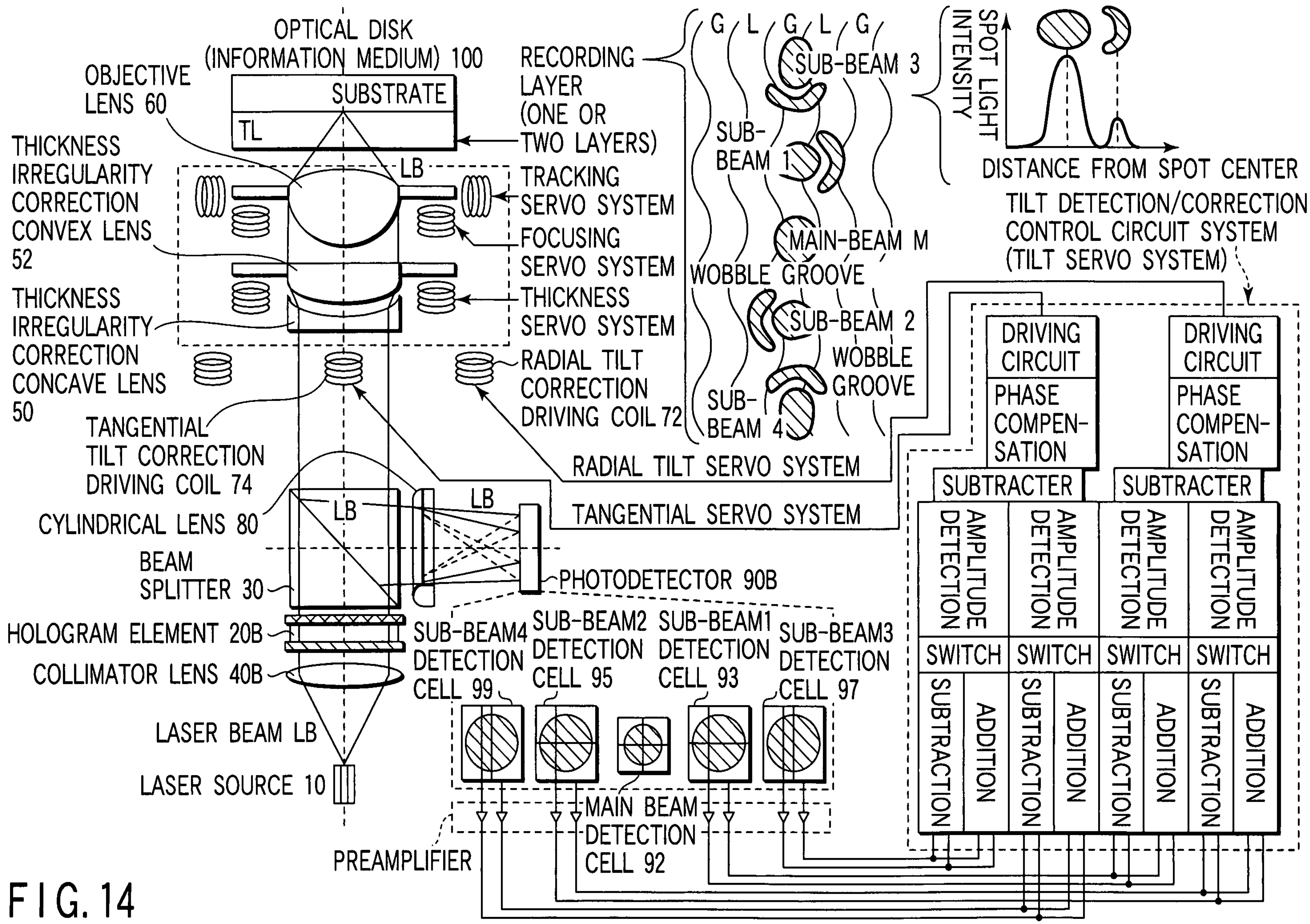

FIG. 14

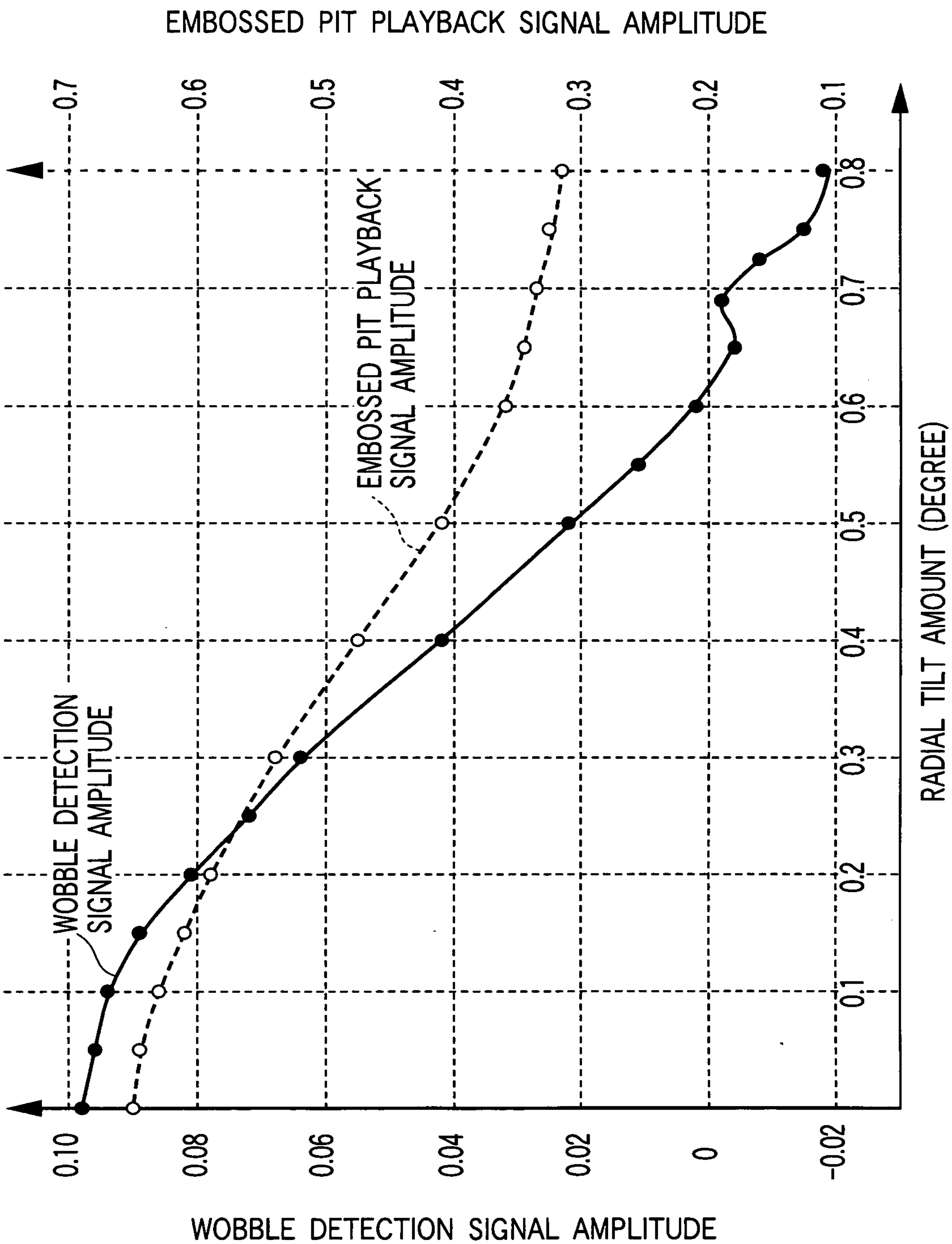
EMBOSSED PIT PLAYBACK SIGNAL AMPLITUDE
0.7
0.6
0.5
0.4
0.3
0.2
0.1
EMBOSSED PIT PLAYBACK SIGNAL AMPLITUDE
WOBBLE DETECTION SIGNAL AMPLITUDE
0.10
0.08
0.06
0.04
0.02
0
-0.02
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
RADIAL TILT AMOUNT (DEGREE)
WOBBLE DETECTION SIGNAL AMPLITUDE

FIG. 15

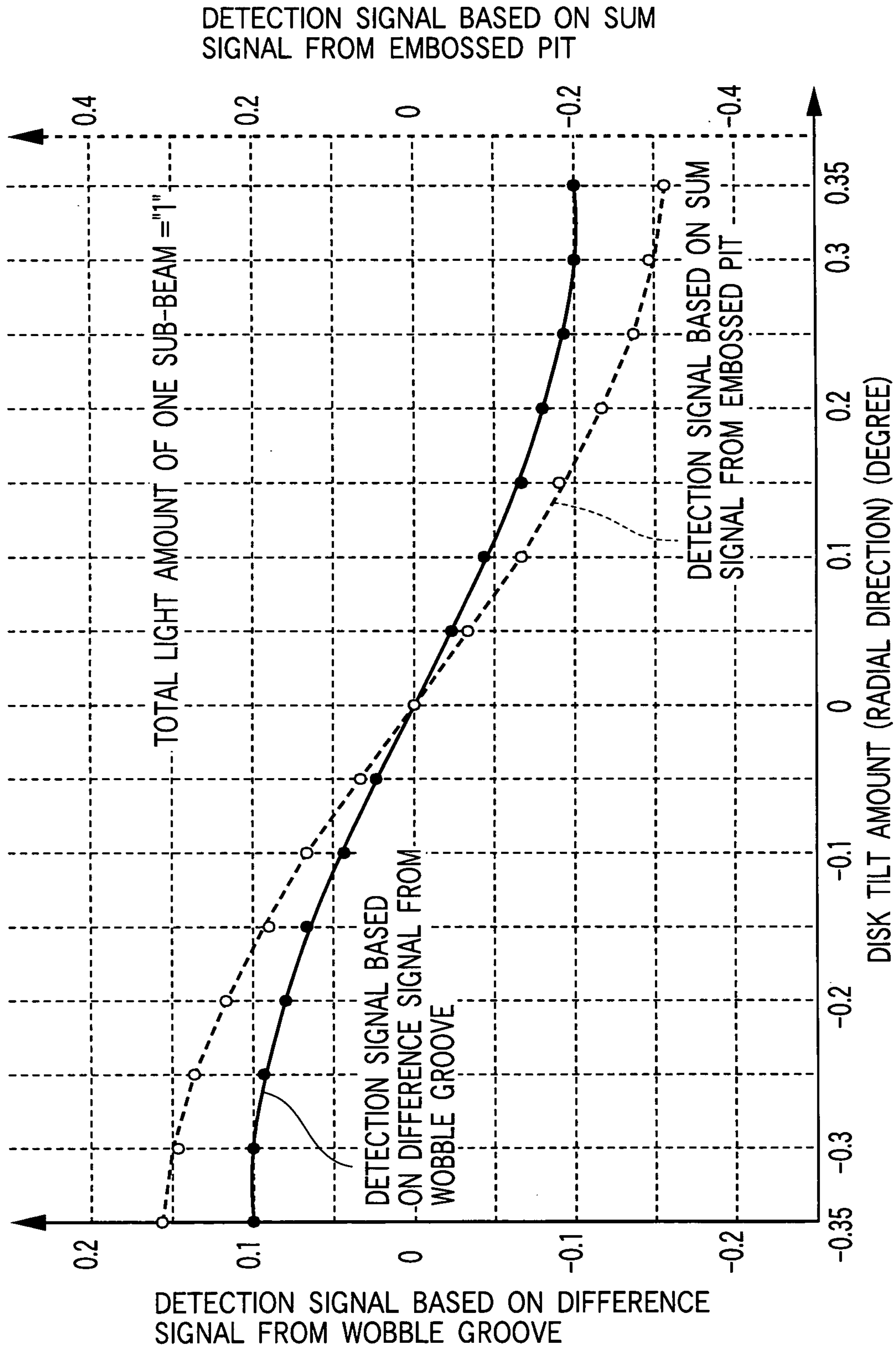
DETECTION SIGNAL BASED ON SUM SIGNAL FROM EMBOSSED PIT
0.4
0.2
0
-0.2
-0.4
TOTAL LIGHT AMOUNT OF ONE SUB-BEAM ="1"
DETECTION SIGNAL BASED ON SUM SIGNAL FROM EMBOSSED PIT
DETECTION SIGNAL BASED ON DIFFERENCE SIGNAL FROM WOBBLE GROOVE
-0.35
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.35
DISK TILT AMOUNT (RADIAL DIRECTION) (DEGREE)
0.2
0.1
0
-0.1
-0.2
DETECTION SIGNAL BASED ON DIFFERENCE SIGNAL FROM WOBBLE GROOVE

FIG.16

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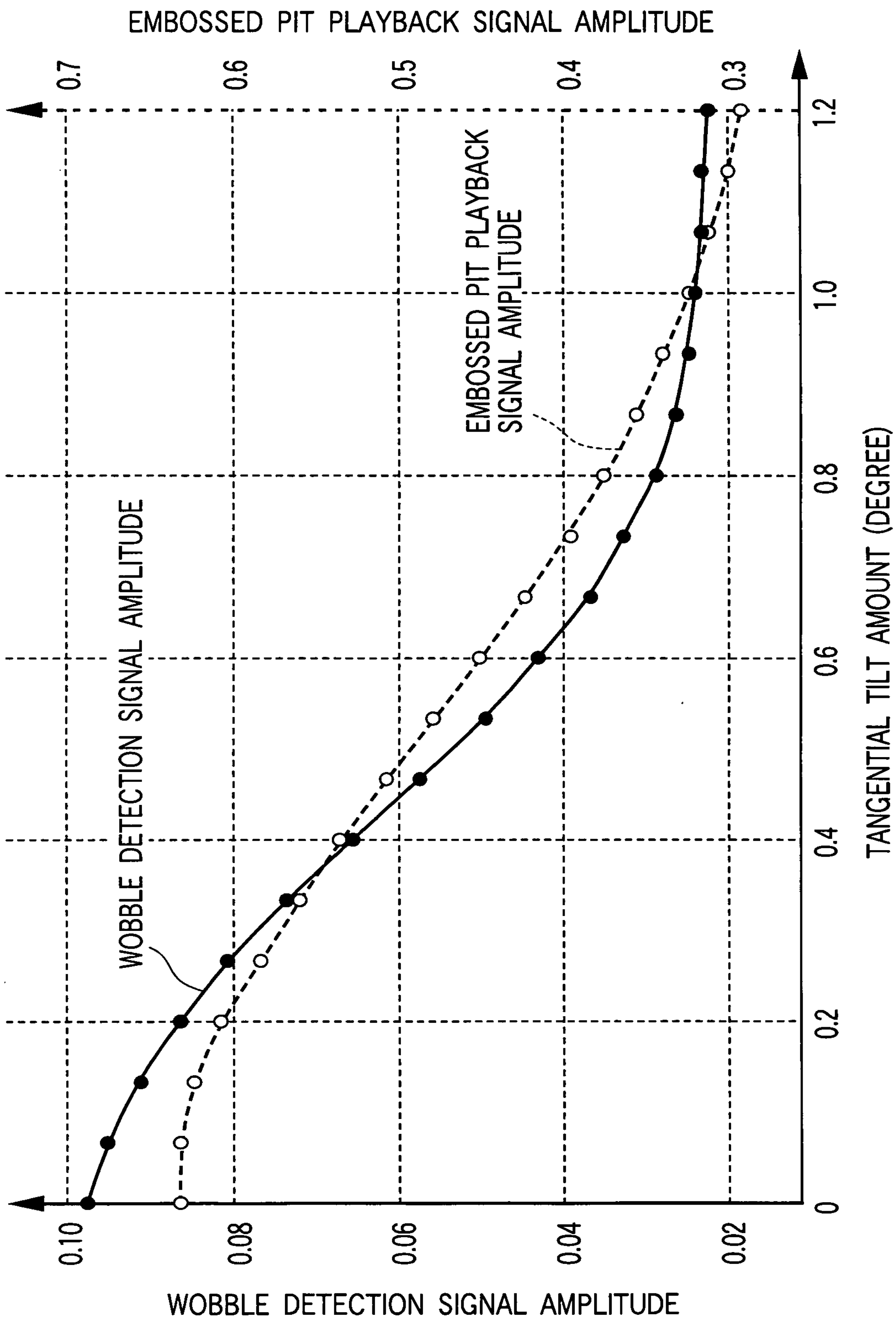


FIG.17

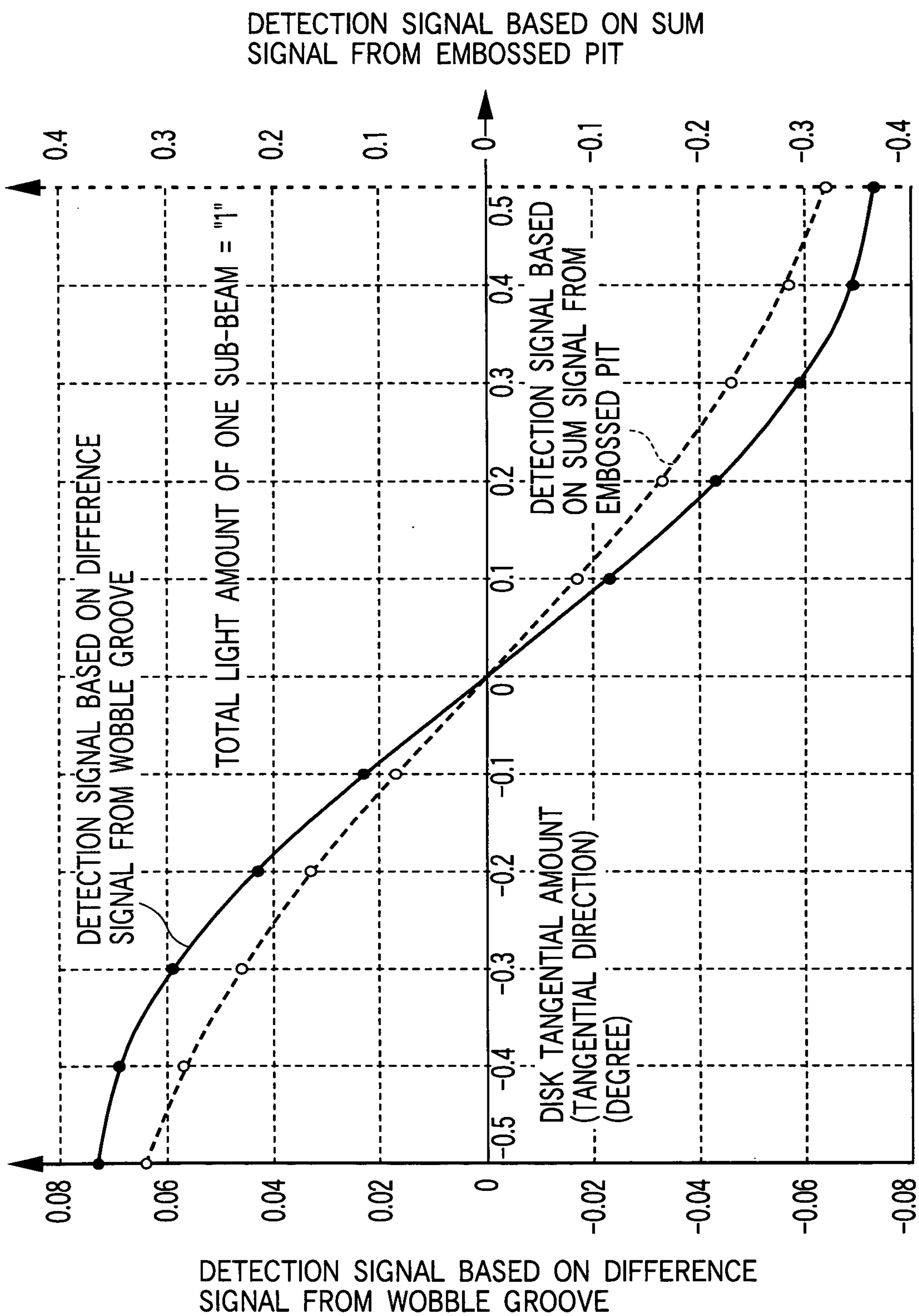

DETECTION SIGNAL BASED ON SUM SIGNAL FROM EMBOSSED PIT
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
TOTAL LIGHT AMOUNT OF ONE SUB-BEAM = "1"
DETECTION SIGNAL BASED ON DIFFERENCE SIGNAL FROM WOBBLE GROOVE
DETECTION SIGNAL BASED ON SUM SIGNAL FROM EMBOSSED PIT
-0.5
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
0.5
DISK TANGENTIAL AMOUNT
(TANGENTIAL DIRECTION)
(DEGREE)
0.08
0.06
0.04
0.02
0
-0.02
-0.04
-0.06
-0.08
DETECTION SIGNAL BASED ON DIFFERENCE SIGNAL FROM WOBBLE GROOVE

FIG.18

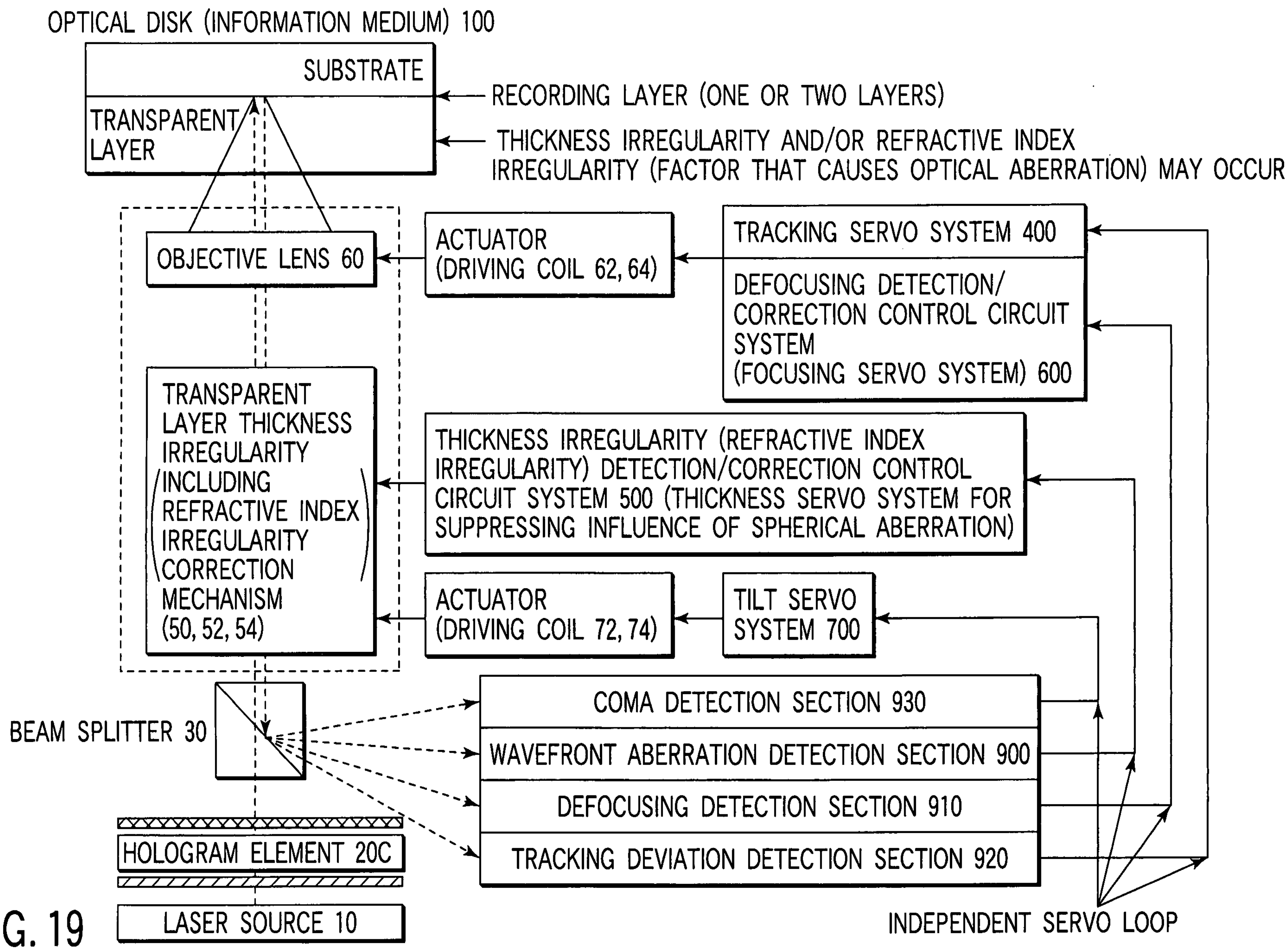

OPTICAL DISK (INFORMATION MEDIUM) 100
SUBSTRATE
TRANSPARENT LAYER
RECORDING LAYER (ONE OR TWO LAYERS)
THICKNESS IRREGULARITY AND/OR REFRACTIVE INDEX IRREGULARITY (FACTOR THAT CAUSES OPTICAL ABERRATION) MAY OCCUR
OBJECTIVE LENS 60
ACTUATOR (DRIVING COIL 62, 64)
TRACKING SERVO SYSTEM 400
DEFOCUSING DETECTION/ CORRECTION CONTROL CIRCUIT SYSTEM (FOCUSING SERVO SYSTEM) 600
TRANSPARENT LAYER THICKNESS IRREGULARITY (INCLUDING REFRACTIVE INDEX IRREGULARITY) CORRECTION MECHANISM (50, 52, 54)
THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 500 (THICKNESS SERVO SYSTEM FOR SUPPRESSING INFLUENCE OF SPHERICAL ABERRATION)
ACTUATOR (DRIVING COIL 72, 74)
TILT SERVO SYSTEM 700
BEAM SPLITTER 30
COMA DETECTION SECTION 930
WAVEFRONT ABERRATION DETECTION SECTION 900
DEFOCUSING DETECTION SECTION 910
TRACKING DEVIATION DETECTION SECTION 920
HOLOGRAM ELEMENT 20C
LASER SOURCE 10
INDEPENDENT SERVO LOOP

FIG. 19

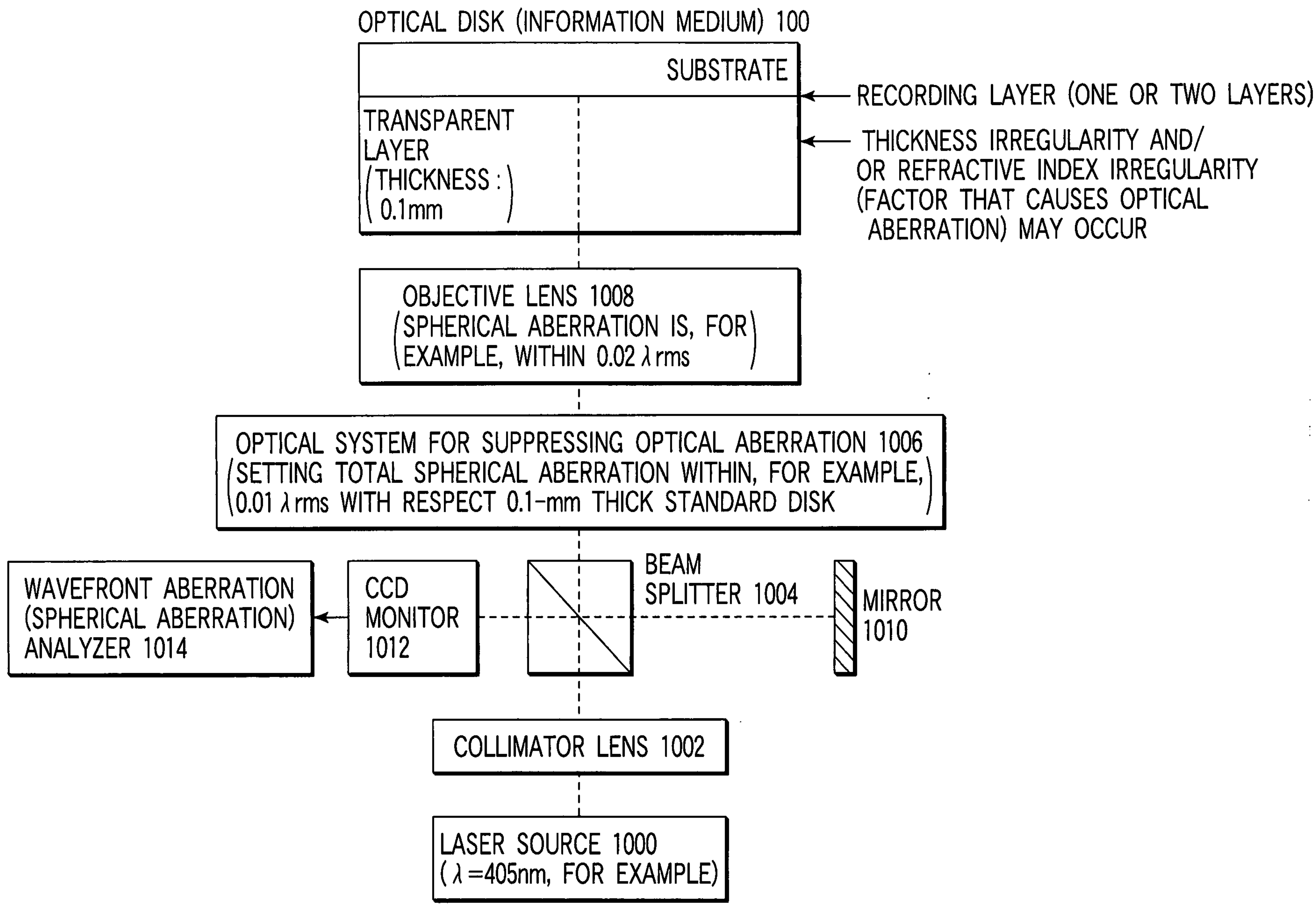

OPTICAL DISK (INFORMATION MEDIUM) 100
SUBSTRATE
TRANSPARENT LAYER (THICKNESS : 0.1mm)
RECORDING LAYER (ONE OR TWO LAYERS)
THICKNESS IRREGULARITY AND/OR REFRACTIVE INDEX IRREGULARITY (FACTOR THAT CAUSES OPTICAL ABERRATION) MAY OCCUR
OBJECTIVE LENS 1008 (SPHERICAL ABERRATION IS, FOR EXAMPLE, WITHIN 0.02 λrms)
OPTICAL SYSTEM FOR SUPPRESSING OPTICAL ABERRATION 1006 (SETTING TOTAL SPHERICAL ABERRATION WITHIN, FOR EXAMPLE, 0.01 λrms WITH RESPECT 0.1-mm THICK STANDARD DISK)
WAVEFRONT ABERRATION (SPHERICAL ABERRATION) ANALYZER 1014
CCD MONITOR 1012
BEAM SPLITTER 1004
MIRROR 1010
COLLIMATOR LENS 1002
LASER SOURCE 1000 (λ=405nm, FOR EXAMPLE)

FIG. 20

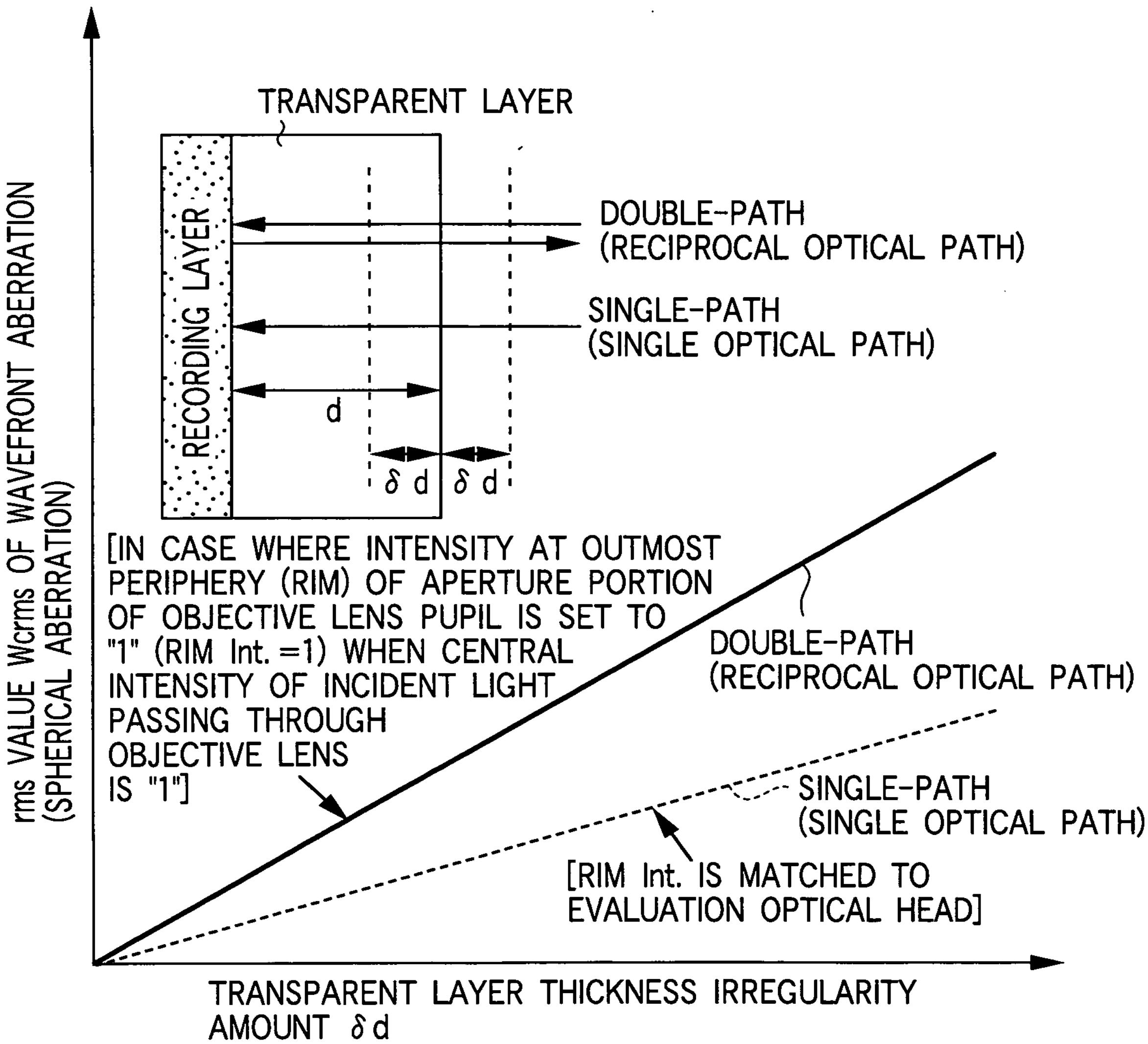

TRANSPARENT LAYER
RECORDING LAYER
DOUBLE-PATH
(RECIPROCAL OPTICAL PATH)
SINGLE-PATH
(SINGLE OPTICAL PATH)
d
δd
δd
rms VALUE Wcrms OF WAVEFRONT ABERRATION
(SPHERICAL ABERRATION)
[IN CASE WHERE INTENSITY AT OUTMOST PERIPHERY (RIM) OF APERTURE PORTION OF OBJECTIVE LENS PUPIL IS SET TO "1" (RIM Int. =1) WHEN CENTRAL INTENSITY OF INCIDENT LIGHT PASSING THROUGH OBJECTIVE LENS IS "1"]
DOUBLE-PATH
(RECIPROCAL OPTICAL PATH)
SINGLE-PATH
(SINGLE OPTICAL PATH)
[RIM Int. IS MATCHED TO EVALUATION OPTICAL HEAD]
TRANSPARENT LAYER THICKNESS IRREGULARITY AMOUNT δd

FIG. 21

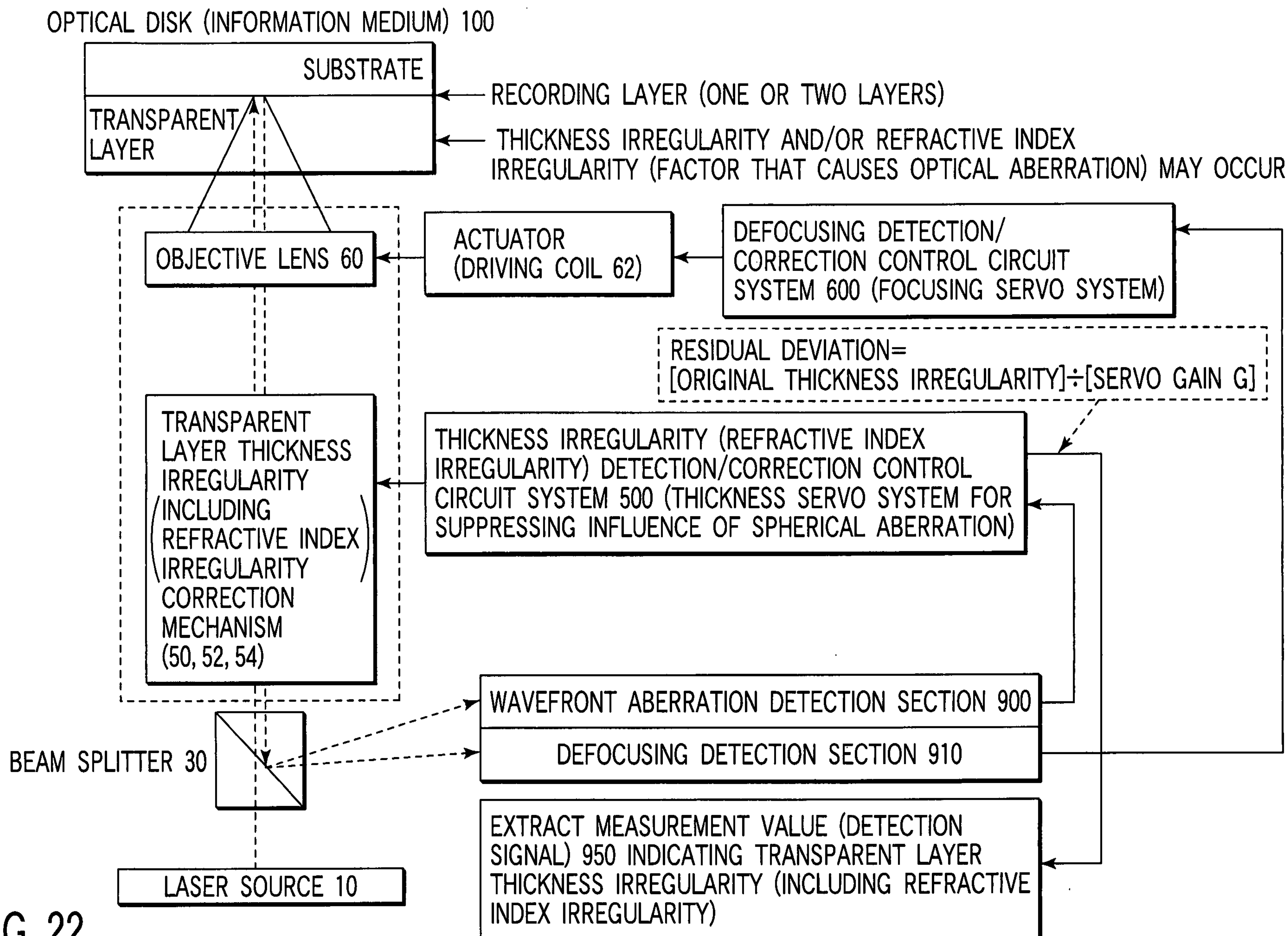

OPTICAL DISK (INFORMATION MEDIUM) 100
SUBSTRATE
TRANSPARENT LAYER
RECORDING LAYER (ONE OR TWO LAYERS)
THICKNESS IRREGULARITY AND/OR REFRACTIVE INDEX IRREGULARITY (FACTOR THAT CAUSES OPTICAL ABERRATION) MAY OCCUR
OBJECTIVE LENS 60
ACTUATOR (DRIVING COIL 62)
DEFOCUSING DETECTION/ CORRECTION CONTROL CIRCUIT SYSTEM 600 (FOCUSING SERVO SYSTEM)
RESIDUAL DEVIATION= [ORIGINAL THICKNESS IRREGULARITY]÷[SERVO GAIN G]
TRANSPARENT LAYER THICKNESS IRREGULARITY (INCLUDING REFRACTIVE INDEX IRREGULARITY) CORRECTION MECHANISM (50, 52, 54)
THICKNESS IRREGULARITY (REFRACTIVE INDEX IRREGULARITY) DETECTION/CORRECTION CONTROL CIRCUIT SYSTEM 500 (THICKNESS SERVO SYSTEM FOR SUPPRESSING INFLUENCE OF SPHERICAL ABERRATION)
WAVEFRONT ABERRATION DETECTION SECTION 900
DEFOCUSING DETECTION SECTION 910
BEAM SPLITTER 30
EXTRACT MEASUREMENT VALUE (DETECTION SIGNAL) 950 INDICATING TRANSPARENT LAYER THICKNESS IRREGULARITY (INCLUDING REFRACTIVE INDEX IRREGULARITY)
LASER SOURCE 10

FIG. 22

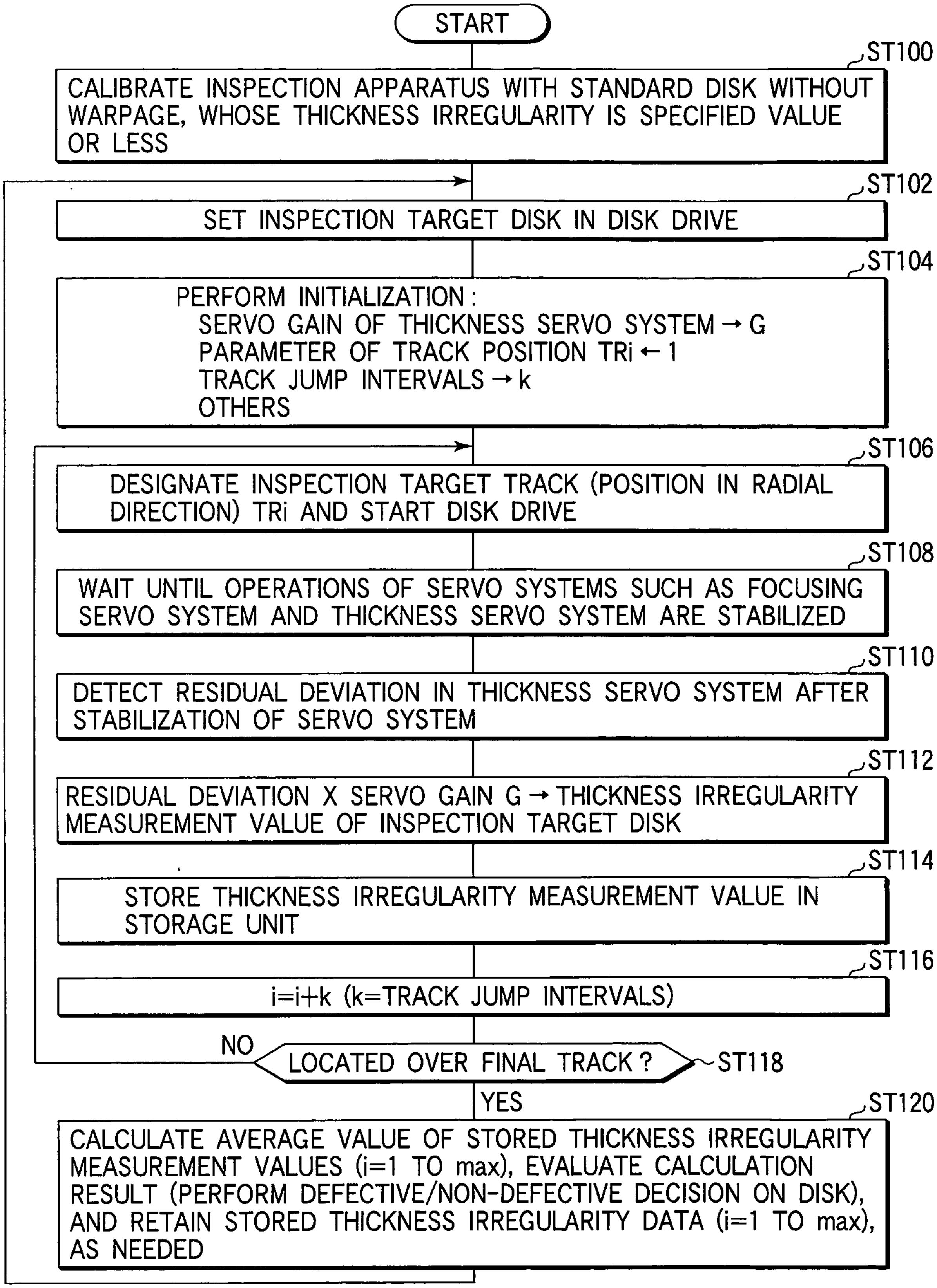

START
ST100
CALIBRATE INSPECTION APPARATUS WITH STANDARD DISK WITHOUT WARPAGE, WHOSE THICKNESS IRREGULARITY IS SPECIFIED VALUE OR LESS
ST102
SET INSPECTION TARGET DISK IN DISK DRIVE
ST104
PERFORM INITIALIZATION:
SERVO GAIN OF THICKNESS SERVO SYSTEM → G
PARAMETER OF TRACK POSITION TRi ← 1
TRACK JUMP INTERVALS → k
OTHERS
ST106
DESIGNATE INSPECTION TARGET TRACK (POSITION IN RADIAL DIRECTION) TRi AND START DISK DRIVE
ST108
WAIT UNTIL OPERATIONS OF SERVO SYSTEMS SUCH AS FOCUSING SERVO SYSTEM AND THICKNESS SERVO SYSTEM ARE STABILIZED
ST110
DETECT RESIDUAL DEVIATION IN THICKNESS SERVO SYSTEM AFTER STABILIZATION OF SERVO SYSTEM
ST112
RESIDUAL DEVIATION X SERVO GAIN G → THICKNESS IRREGULARITY MEASUREMENT VALUE OF INSPECTION TARGET DISK
ST114
STORE THICKNESS IRREGULARITY MEASUREMENT VALUE IN STORAGE UNIT
ST116
i=i+k (k=TRACK JUMP INTERVALS)
NO
LOCATED OVER FINAL TRACK ?
ST118
YES
ST120
CALCULATE AVERAGE VALUE OF STORED THICKNESS IRREGULARITY MEASUREMENT VALUES (i=1 TO max), EVALUATE CALCULATION RESULT (PERFORM DEFECTIVE/NON-DEFECTIVE DECISION ON DISK), AND RETAIN STORED THICKNESS IRREGULARITY DATA (i=1 TO max), AS NEEDED

FIG. 23

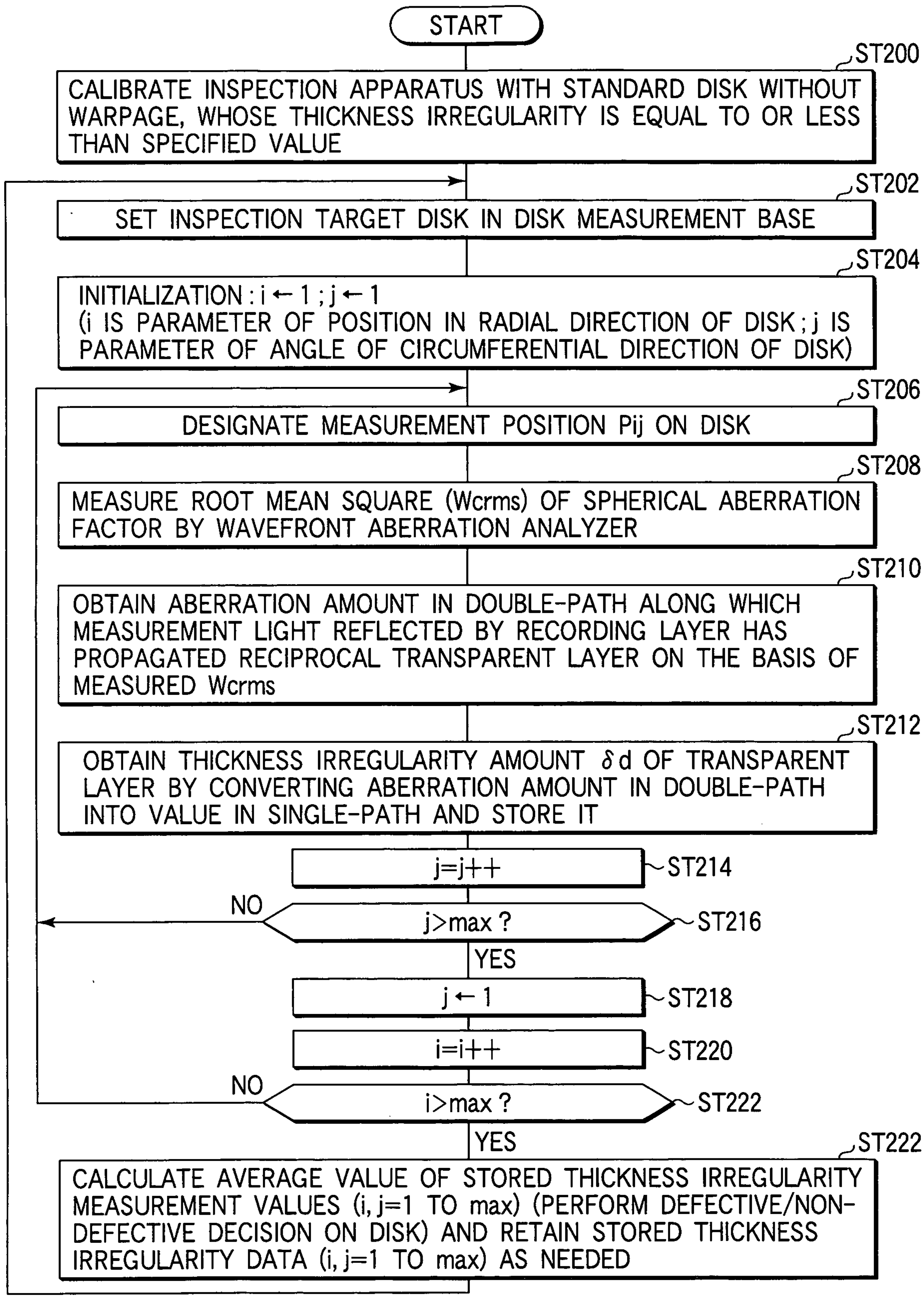
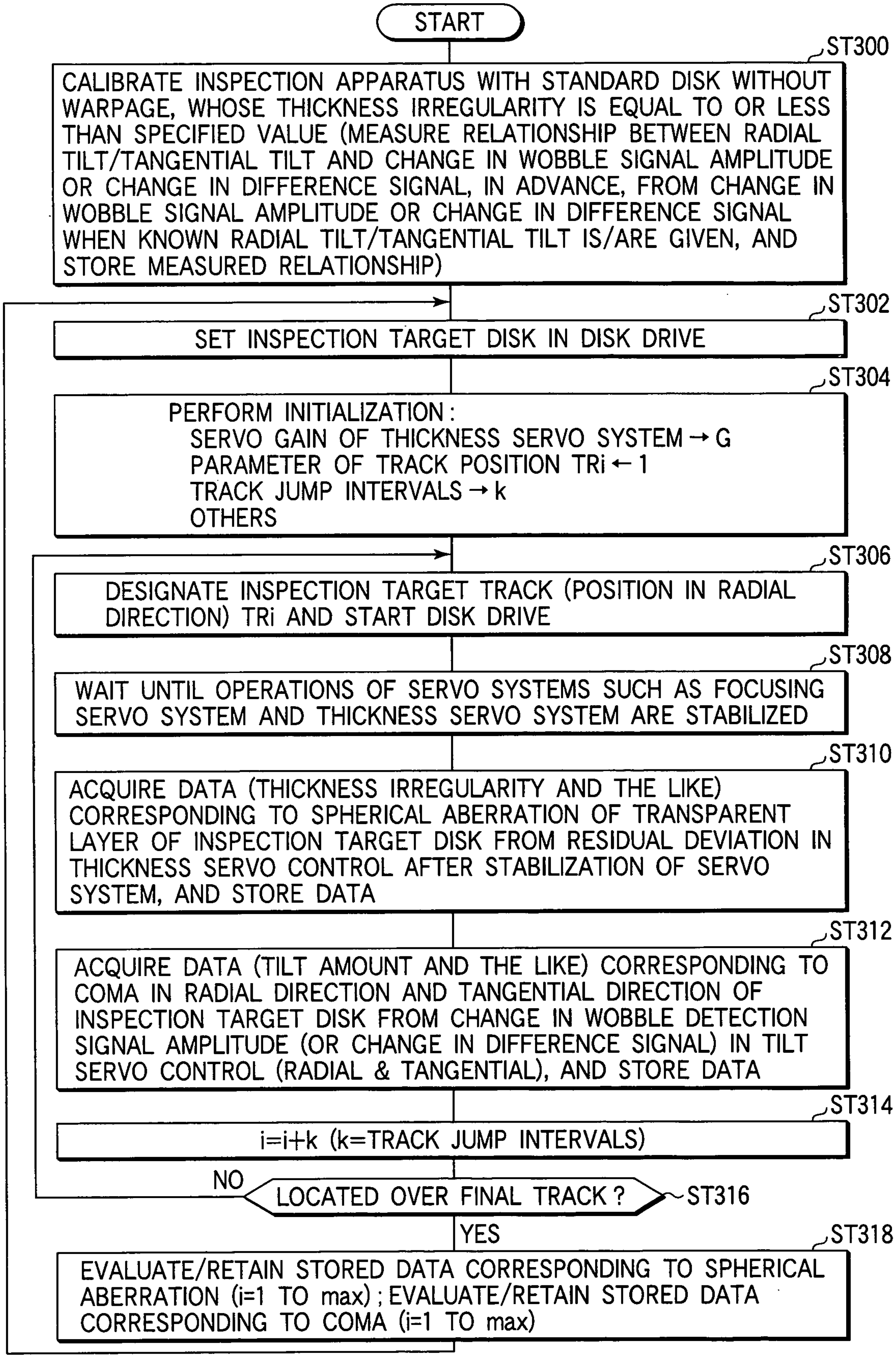

START
ST200
CALIBRATE INSPECTION APPARATUS WITH STANDARD DISK WITHOUT WARPAGE, WHOSE THICKNESS IRREGULARITY IS EQUAL TO OR LESS THAN SPECIFIED VALUE
ST202
SET INSPECTION TARGET DISK IN DISK MEASUREMENT BASE
ST204
INITIALIZATION : i ← 1 ; j ← 1
(i IS PARAMETER OF POSITION IN RADIAL DIRECTION OF DISK ; j IS PARAMETER OF ANGLE OF CIRCUMFERENTIAL DIRECTION OF DISK)
ST206
DESIGNATE MEASUREMENT POSITION Pij ON DISK
ST208
MEASURE ROOT MEAN SQUARE (Wcrms) OF SPHERICAL ABERRATION FACTOR BY WAVEFRONT ABERRATION ANALYZER
ST210
OBTAIN ABERRATION AMOUNT IN DOUBLE-PATH ALONG WHICH MEASUREMENT LIGHT REFLECTED BY RECORDING LAYER HAS PROPAGATED RECIPROCAL TRANSPARENT LAYER ON THE BASIS OF MEASURED Wcrms
ST212
OBTAIN THICKNESS IRREGULARITY AMOUNT δd OF TRANSPARENT LAYER BY CONVERTING ABERRATION AMOUNT IN DOUBLE-PATH INTO VALUE IN SINGLE-PATH AND STORE IT
j=j++
ST214
NO
j>max ?
ST216
YES
j ← 1
ST218
i=i++
ST220
NO
i>max ?
ST222
YES
ST222
CALCULATE AVERAGE VALUE OF STORED THICKNESS IRREGULARITY MEASUREMENT VALUES (i, j=1 TO max) (PERFORM DEFECTIVE/NON-DEFECTIVE DECISION ON DISK) AND RETAIN STORED THICKNESS IRREGULARITY DATA (i, j=1 TO max) AS NEEDED

FIG. 24


START
ST300
CALIBRATE INSPECTION APPARATUS WITH STANDARD DISK WITHOUT WARPAGE, WHOSE THICKNESS IRREGULARITY IS EQUAL TO OR LESS THAN SPECIFIED VALUE (MEASURE RELATIONSHIP BETWEEN RADIAL TILT/TANGENTIAL TILT AND CHANGE IN WOBBLE SIGNAL AMPLITUDE OR CHANGE IN DIFFERENCE SIGNAL, IN ADVANCE, FROM CHANGE IN WOBBLE SIGNAL AMPLITUDE OR CHANGE IN DIFFERENCE SIGNAL WHEN KNOWN RADIAL TILT/TANGENTIAL TILT IS/ARE GIVEN, AND STORE MEASURED RELATIONSHIP)
ST302
SET INSPECTION TARGET DISK IN DISK DRIVE
ST304
PERFORM INITIALIZATION:
SERVO GAIN OF THICKNESS SERVO SYSTEM → G
PARAMETER OF TRACK POSITION TRi ← 1
TRACK JUMP INTERVALS → k
OTHERS
ST306
DESIGNATE INSPECTION TARGET TRACK (POSITION IN RADIAL DIRECTION) TRi AND START DISK DRIVE
ST308
WAIT UNTIL OPERATIONS OF SERVO SYSTEMS SUCH AS FOCUSING SERVO SYSTEM AND THICKNESS SERVO SYSTEM ARE STABILIZED
ST310
ACQUIRE DATA (THICKNESS IRREGULARITY AND THE LIKE) CORRESPONDING TO SPHERICAL ABERRATION OF TRANSPARENT LAYER OF INSPECTION TARGET DISK FROM RESIDUAL DEVIATION IN THICKNESS SERVO CONTROL AFTER STABILIZATION OF SERVO SYSTEM, AND STORE DATA
ST312
ACQUIRE DATA (TILT AMOUNT AND THE LIKE) CORRESPONDING TO COMA IN RADIAL DIRECTION AND TANGENTIAL DIRECTION OF INSPECTION TARGET DISK FROM CHANGE IN WOBBLE DETECTION SIGNAL AMPLITUDE (OR CHANGE IN DIFFERENCE SIGNAL) IN TILT SERVO CONTROL (RADIAL & TANGENTIAL), AND STORE DATA
ST314
i=i+k (k=TRACK JUMP INTERVALS)
NO
LOCATED OVER FINAL TRACK ?
ST316
YES
ST318
EVALUATE/RETAIN STORED DATA CORRESPONDING TO SPHERICAL ABERRATION (i=1 TO max); EVALUATE/RETAIN STORED DATA CORRESPONDING TO COMA (i=1 TO max)

F I G. 25

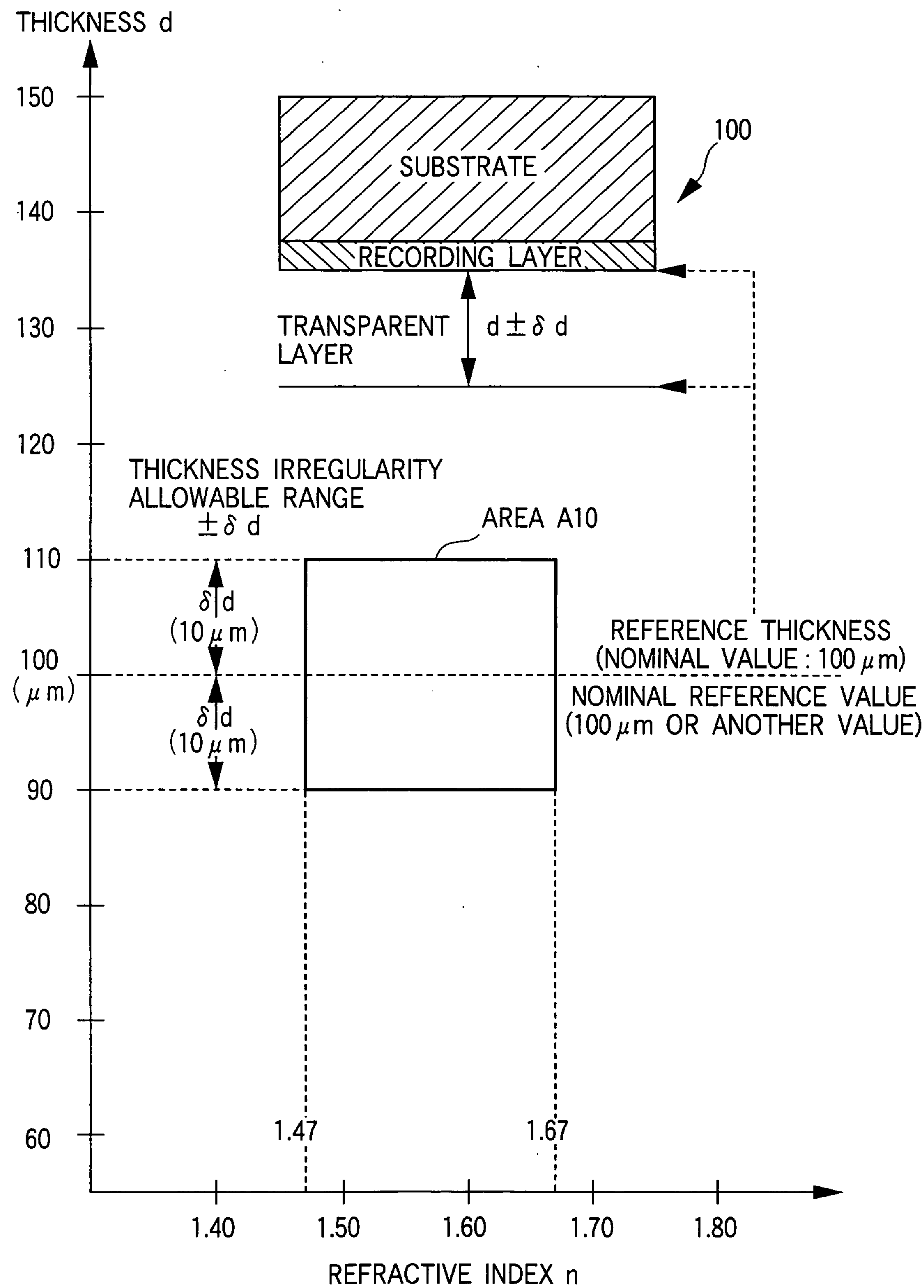
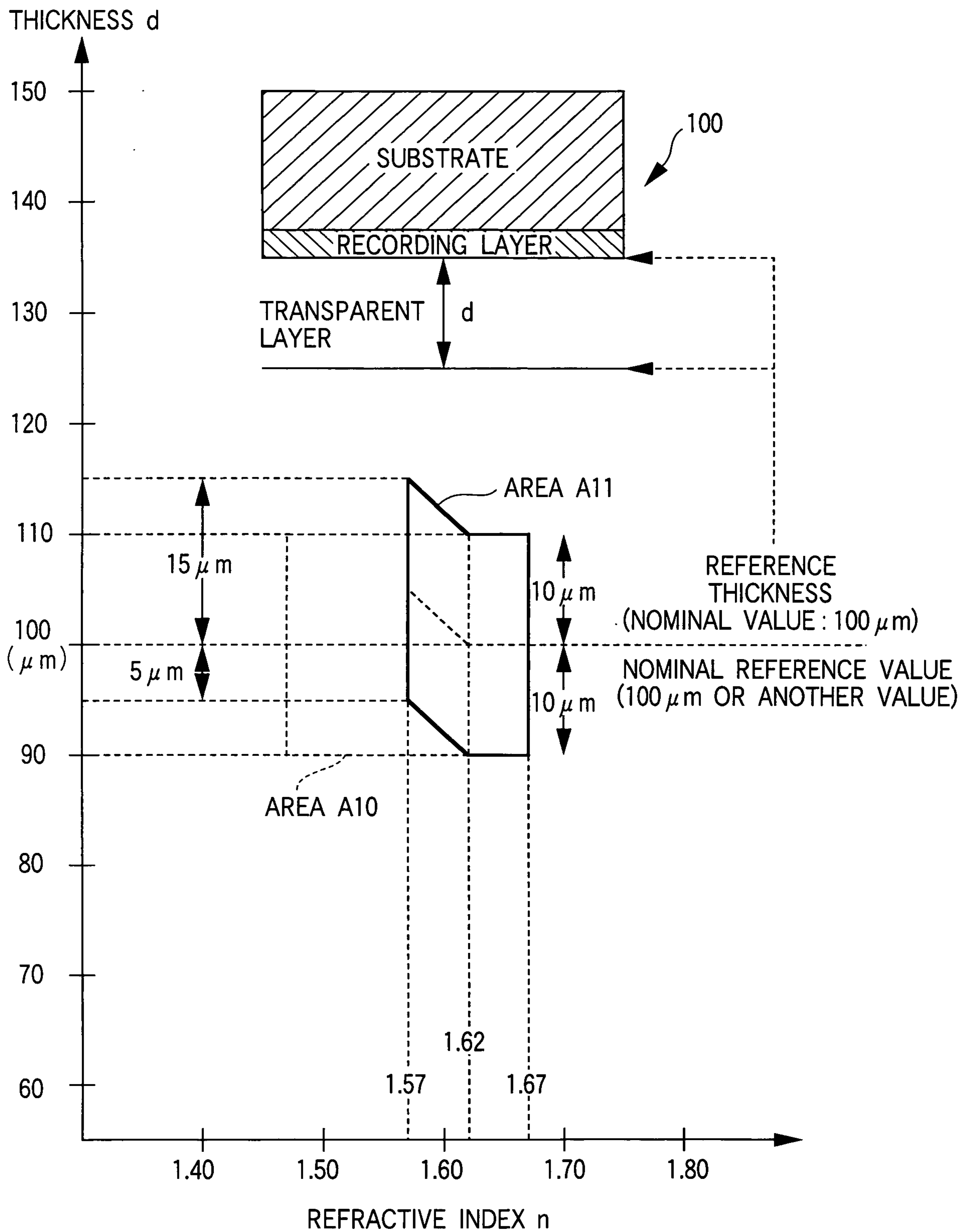
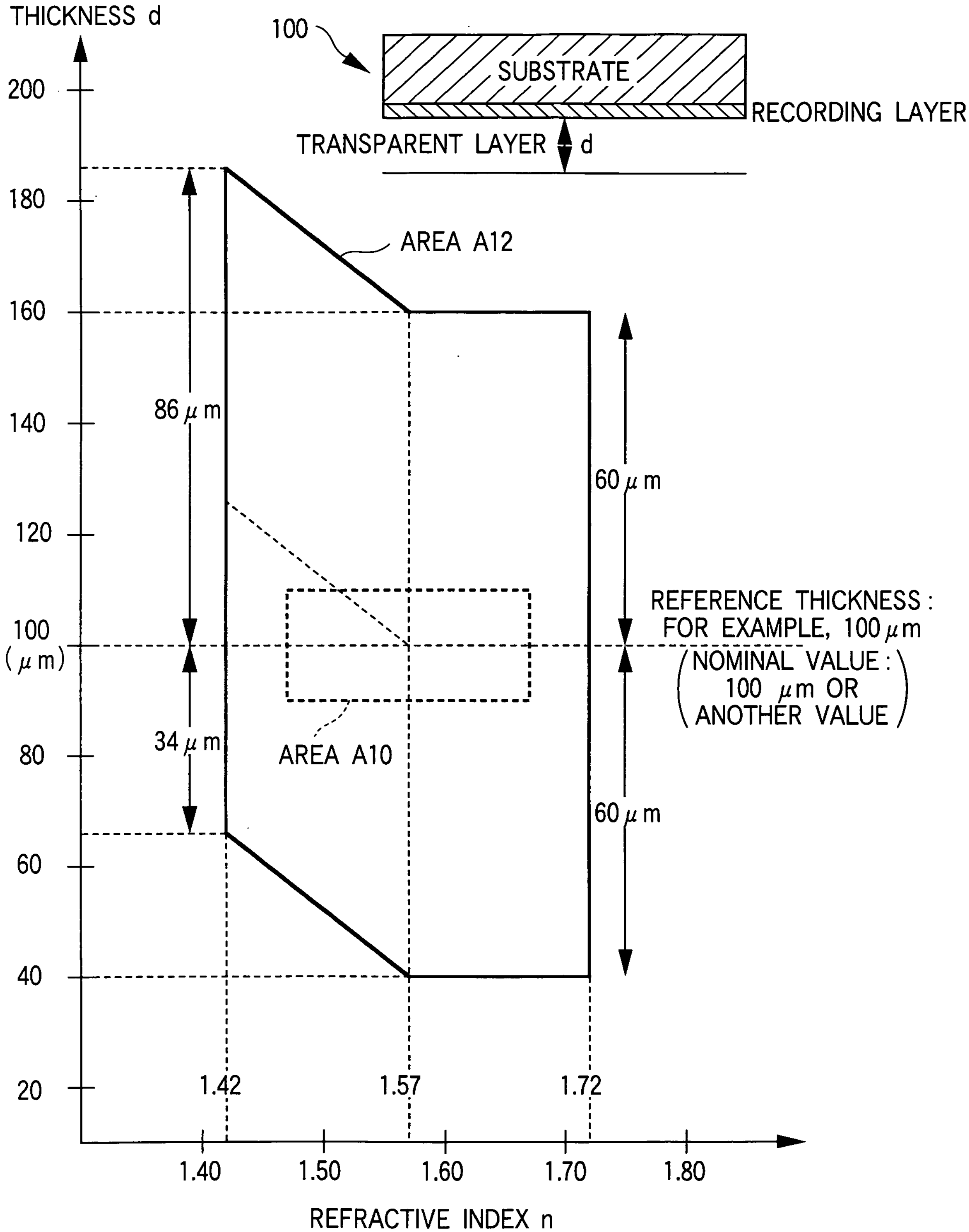

THICKNESS d
150
140
130
120
110
100
(μm)
90
80
70
60
SUBSTRATE
100
RECORDING LAYER
TRANSPARENT LAYER
d±δd
THICKNESS IRREGULARITY ALLOWABLE RANGE ±δd
AREA A10
δd (10μm)
δd (10μm)
REFERENCE THICKNESS (NOMINAL VALUE : 100μm)
NOMINAL REFERENCE VALUE (100μm OR ANOTHER VALUE)
1.47
1.67
1.40
1.50
1.60
1.70
1.80
REFRACTIVE INDEX n

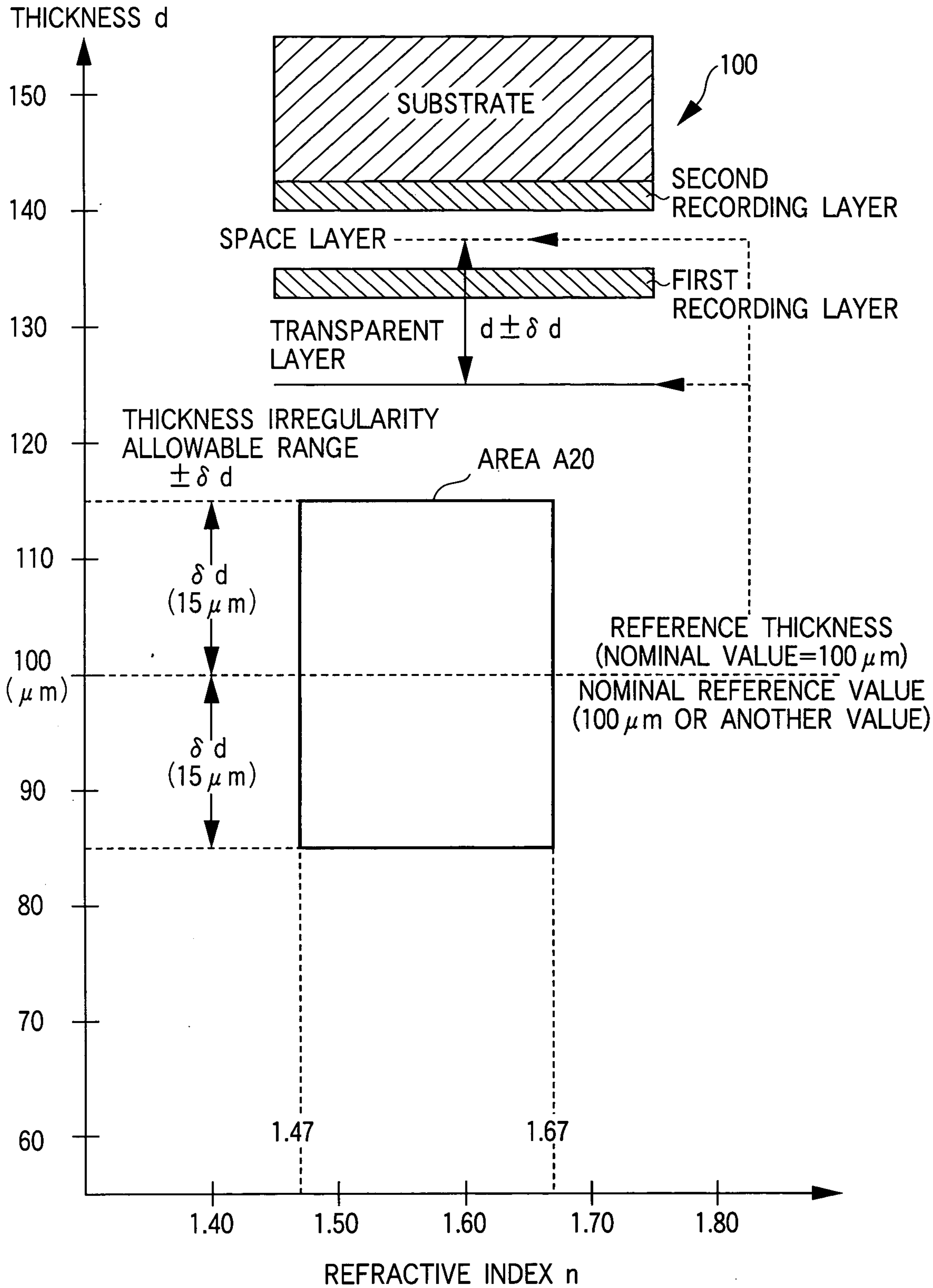
FIG. 26


THICKNESS d
150
140
130
120
110
100
(μm)
90
80
70
60
SUBSTRATE
RECORDING LAYER
100
TRANSPARENT LAYER
d
AREA A11
15 μm
5 μm
10 μm
10 μm
REFERENCE THICKNESS
(NOMINAL VALUE : 100 μm)
NOMINAL REFERENCE VALUE
(100 μm OR ANOTHER VALUE)
AREA A10
1.62
1.57
1.67
1.40
1.50
1.60
1.70
1.80
REFRACTIVE INDEX n

F I G. 27


THICKNESS d
100
SUBSTRATE
RECORDING LAYER
TRANSPARENT LAYER
d
200
180
160
140
120
100 (μm)
80
60
40
20
AREA A12
86 μm
60 μm
REFERENCE THICKNESS : FOR EXAMPLE, 100 μm
(NOMINAL VALUE : 100 μm OR ANOTHER VALUE)
34 μm
AREA A10
60 μm
1.42
1.57
1.72
1.40
1.50
1.60
1.70
1.80
REFRACTIVE INDEX n

F I G. 28


THICKNESS d
150
140
130
120
110
100
(μm)
90
80
70
60
SUBSTRATE
100
SECOND
RECORDING LAYER
SPACE LAYER
FIRST
RECORDING LAYER
TRANSPARENT
LAYER
d ± δ d
THICKNESS IRREGULARITY
ALLOWABLE RANGE
± δ d
AREA A20
δ d
(15 μm)
δ d
(15 μm)
REFERENCE THICKNESS
(NOMINAL VALUE=100 μm)
NOMINAL REFERENCE VALUE
(100 μm OR ANOTHER VALUE)
1.47
1.67
1.40
1.50
1.60
1.70
1.80
REFRACTIVE INDEX n

F I G. 29

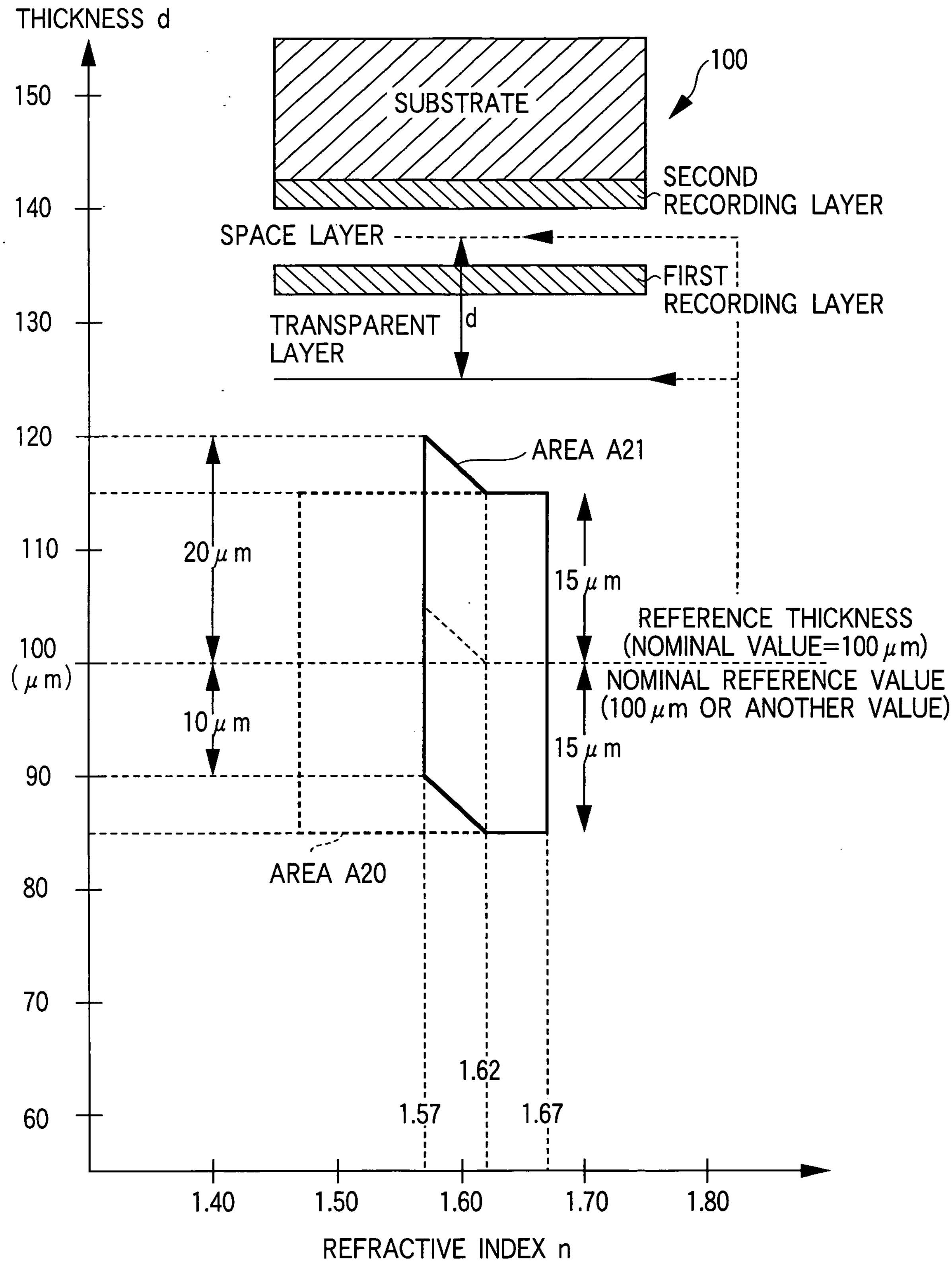

THICKNESS d
150
140
130
120
110
100
(μm)
90
80
70
60
100
SUBSTRATE
SECOND RECORDING LAYER
SPACE LAYER
FIRST RECORDING LAYER
TRANSPARENT LAYER
d
AREA A21
20μm
10μm
15μm
15μm
REFERENCE THICKNESS (NOMINAL VALUE=100μm)
NOMINAL REFERENCE VALUE (100μm OR ANOTHER VALUE)
AREA A20
1.62
1.57
1.67
1.40
1.50
1.60
1.70
1.80
REFRACTIVE INDEX n

FIG. 30

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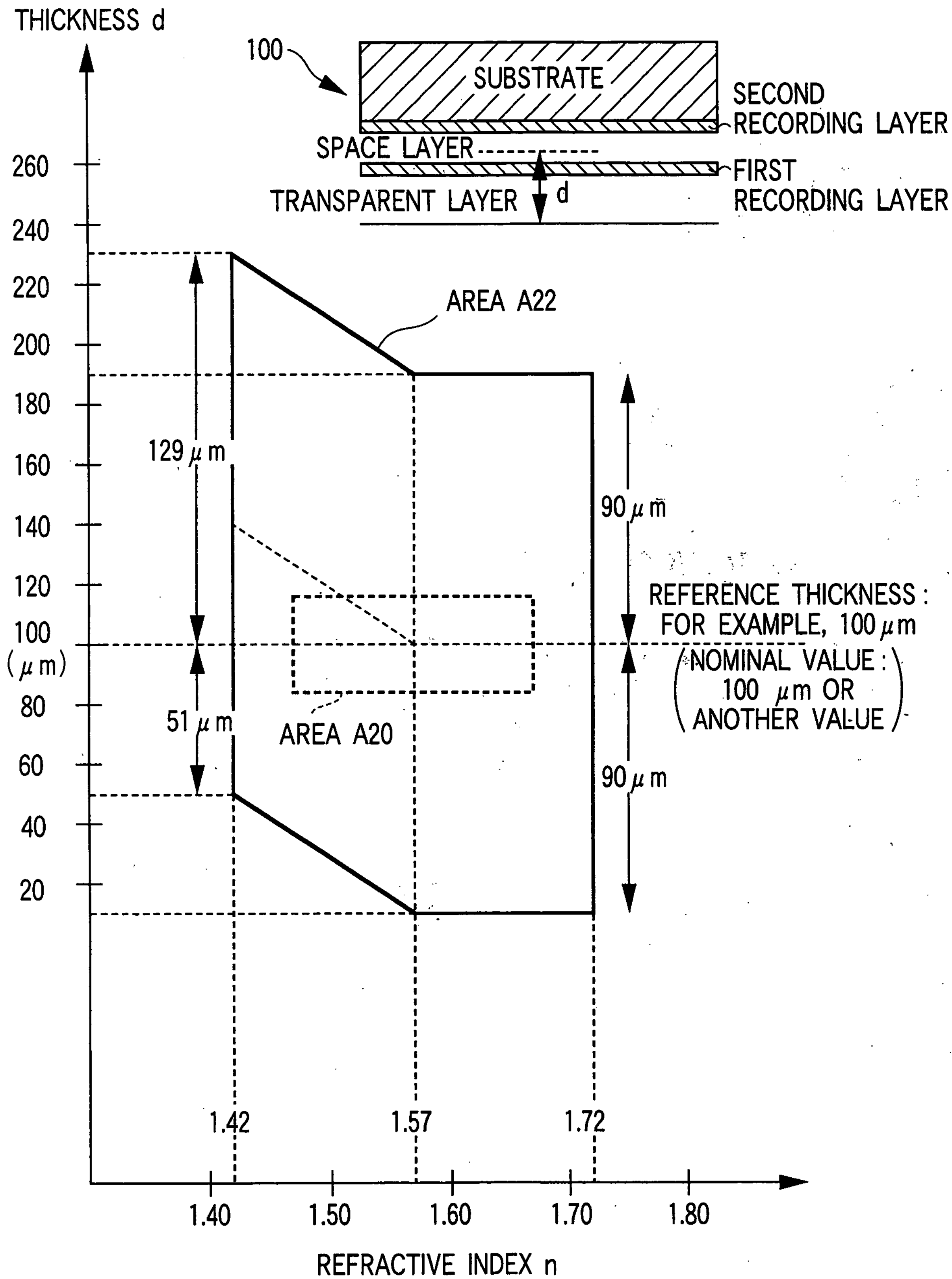

FIG. 31